MODEL Airplane NEWS

SEPTEMBER 1942
20c

GAS MODEL ARMY SCOUT

(See page 15)

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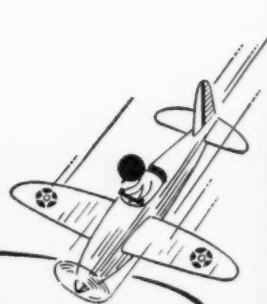

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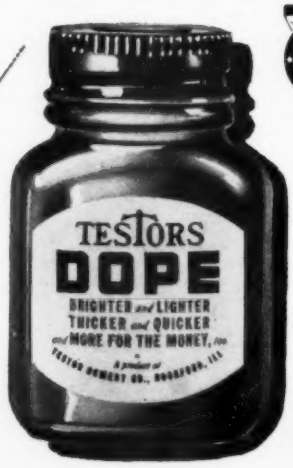

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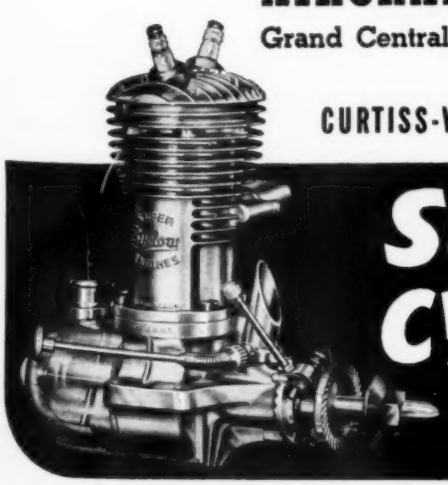

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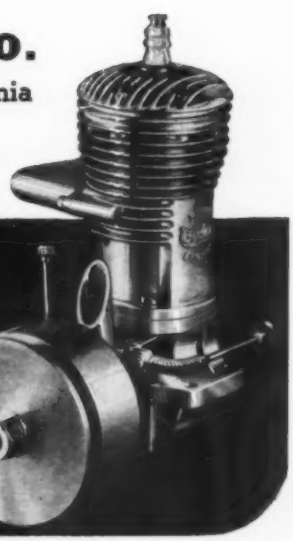

Special to MODEL AIRPLANE NEWS

LOSS of the aircraft carrier U.S.S. Lexington, first major unit of our Fleet to be destroyed, brought to an end a near-legendary career of one of the strangest and most magnificent vessels in all the world. With her sister ship, the U.S.S. Saratoga, they were the largest, fastest and most powerful warships ever built; and to bear this out some interesting comparisons may be made:

	U.S.S. Lexington	U.S.S. Tennessee
Length	888 ft.	624 ft.
Standard Tonnage	33,000 tons	32,300 tons
Beam	105' 6"	97' 6"
Horsepower	180,000 hp	26,800 hp
Speed	34 knots	21 knots
Crew	1900	1480

The Tennessee has been taken as a typical U. S. battleship; but an even more interesting comparison can be made between the 15-year old "Lex" and the latest and most powerful U.S. battleship, the recently launched Washington, for this huge vessel has a displacement of only 35,000 tons, is 750 ft. long, has only 115,000 hp. It carries a crew of 1500 men. As for speed, the "Lex" could outrun all the battleships of the world's navies (including our new giant vessels) and even all our Navy's heavy cruisers.

And seamen everywhere like to tell the story of how the "Lex" supplied a city of 150,000 persons with electricity when the Tacoma, Wash., power stations failed in 1929, plunging the city in darkness. The "Lex" was hauled in for the job and her giant engines provided enough power to maintain the entire city! Certainly there will never be another carrier like her—the stories told throughout the Navy of the grand old lady would fill a huge volume. And now the "Sara," her twin sister for all those 15 years, must carry on without her. She died in action defending her homeland and no greater tribute could be paid!

Maj. Gen. George E. Stratemeyer has been appointed Chief of Staff of the Army Air Forces under Lt. Gen. H. H. Arnold, it is announced. Gen. Stratemeyer, former commander of the Southeast Training Center at Maxwell Field, Ala., succeeds Maj. Gen. Millard F. Harmon, who has been assigned to "another very important post which will not be made public at this time."

The Army Air Forces Flying Training Command Headquarters has been moved from Washington to Ft. Worth, Tex., approximate geographic center of the Air Forces training bases, which are located, in the great Southwest. Maj. Gen. Barton K. Yount, commander of training activities, states the move has been made "to increase the efficiency of coordinating and directing the rapidly expanding activities of flying training within the Army Air Forces."

Some conception of our aircraft factories' production rate is gained with release of a telegram from Lt. Gen. Arnold to workers at Vultee Aircraft: "Word has just reached me that today your 4000th plane will roll off the assembly line. I wish to congratulate the men and women of your company for the dogged perseverance with which they have attacked the job of producing trainers which are responsible for turning out pilots who are attaining victories for us throughout all parts of the world today." That a total of *four thousand* Vultee training planes has been sent to the Air Forces is certainly encouraging news and a mark for us all to shoot at . . . and better!

New York launched the nation's most progressive aviation program, calling for 36 vocational high schools to begin glider training programs early in July. Youths from 14 years of age upwards will be flying 800 gliders within two years. These gliders will be sufficient to solo 12,000 men and prepare them for speed-up power-driven airplane training.

The term "Pursuit" gradually became obsolescent within the Army Air Forces tactical organization and was replaced with the term "Interceptor." But now even that aptly descriptive title has given way, officially, to one even more so, for Army single-seaters are now referred to as "Fighters" and tactical organizations equipped with such planes are now known, officially, as "Fighter Squadrons." Certainly there can be no misinterpretation of that term!

One of this war's oddities is the complete aura of mystery surrounding the Jap Zero fighters. No photographs have ever been published, although a perspective silhouette by a well-known artist supposedly has given accurate details of the plane's outlines. However, this drawing was completely in error as evidenced by the Navy's receipt in this country of the remains of a wrecked Zero; it is now being reconditioned and parts are being fabricated to restore the badly damaged ship to its original shape. After this has been done MODEL AIRPLANE NEWS promises to bring you the latest authentic information on this ship, which is known to be deadlier than the dread Messerschmitt 109 fighter and is said to have attacked American formations from altitudes as high as 30,000 feet! Reports from the Pacific, however, inform us that the Zeros disintegrate easily from machine-gun and cannon fire, indicating a sacrifice of armor-plate and protection for high altitude performance.

The Air Transport Command has established a world-wide military air transport system, it was announced in Washington, to carry men, materials and mail to far-flung outposts around the globe. This system provides a framework on which can be built tomorrow's "Round-the-World" airline and much of the planning, construction and organization work, normally at a prohibitive

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14TH YEAR OF PUBLICATION

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Edited by
Charles Hampson Grant

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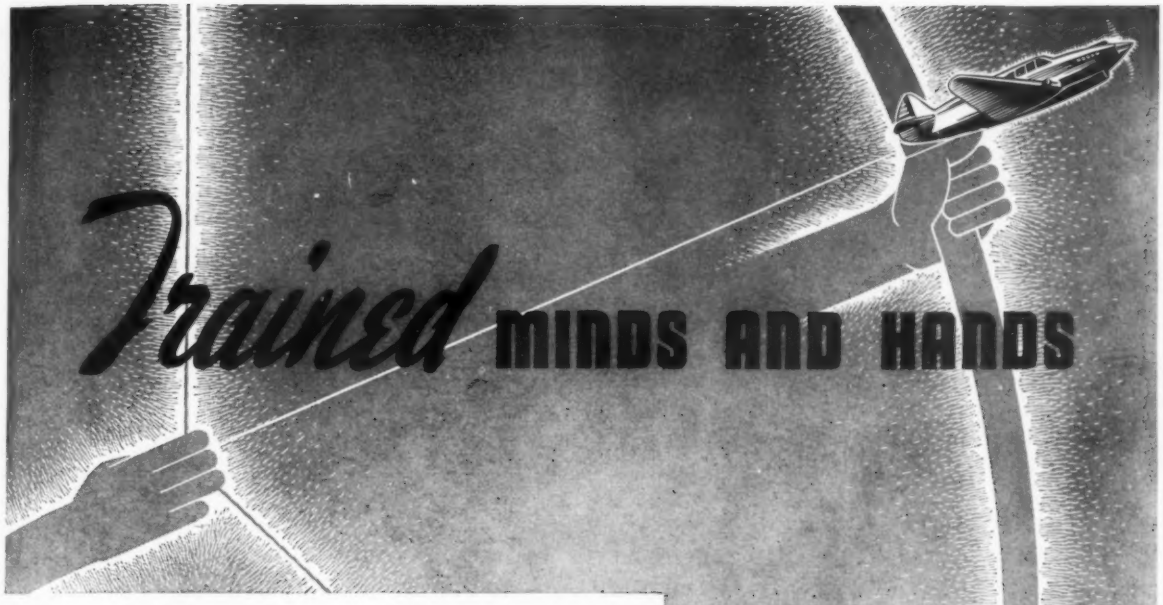


MUST LAUNCH 185,000 WARPLANES

The aviation industry is mustering every facility of the world's greatest industrial civilization to fulfill President Roosevelt's far-sighted demand for 185,000 fighting planes. Because the demand exceeds the supply of skilled aircraftsmen, many inadequately trained men are finding single-phase jobs through cheap "quickie" courses. BUT—the vital supervisory positions can only be held by men with the thorough long range training to reach any objective to which they may be assigned . . . the men who have chosen aviation as a career—not an expedient. They are the only men of this huge production army who are indispensable to America's war effort and who will continue to be indispensable when the aircraft industry steps down from war to peace schedules.

The executives who have made aviation THEIR career know the value of each man is governed by two factors: his intelligent sincerity in selecting aviation as his life work, and THE ABILITY AND EXPERIENCE OF THOSE WHO TRAIN HIM FOR THAT CAREER. They know that Curtiss-Wright Technical Institute graduates are—and for many years have been—thoroughly qualified to fill the industry's exacting requirements.

Located in the very center and a very important part of Southern California's great aircraft industry, with its more than two billion dollars in unfilled orders, Curtiss-Wright Tec has come to be recognized as the nation's leading institution for the training of Aeronautical Engineers and Master Mechanics.

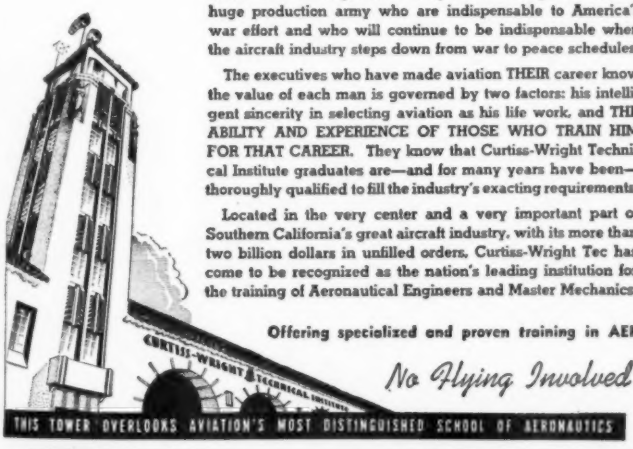
Mr. Donald Douglas, President of the great Douglas Aircraft Company, chose this school for his own son's training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

It is imperative that before you invest in a course of career training you determine what the returns will be on your investment . . . for your choice of a school in which to take your training will determine how much money you will make all the rest of your life.

Curtiss-Wright Tec's career training is carefully designed to do just one thing:—TO MAKE MONEY FOR YOU, so upon graduation you can be independent and self-supporting for life. Our thousands of successful graduates have proven that Curtiss-Wright Tec training gets results and always pays, since it trained them in advance for the highest position they could ever expect to occupy. It can do the same for you.

This school has never guaranteed positions for its graduates, but practically every graduate has obtained immediate employment and is advancing rapidly. The demand for our graduates far exceeds the supply, and we honestly believe that every student who enrolls here will be able to obtain, with our assistance, immediate employment upon graduation.

WARNING!—"Don't miss the boat." The greatest opportunity in your lifetime exists today! There never was such an opportunity in aviation for you: there may never be another. A position awaits you. Insure for yourself a steady income and independence for life. DON'T FOLLOW—LEAD! Send in your enrollment before you "miss the boat."



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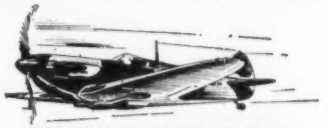

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This is the new beauty which now leads Cleveland's new fleet of World War II fighters and bombers. Model is very attractively camouflaged, has a span of 49⅜" and is a very fast flying model. This highly popular airplane which is doing so much work both in Europe and Africa as well as over the wide stretches of the Pacific should be built by every modelbuilder. C-D "Master" Kit SF-95..... **$7.50**

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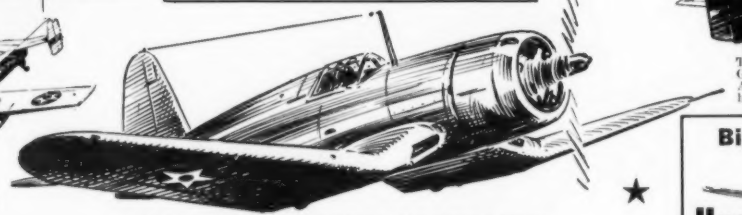

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Famous for its night fighting ability—also used as a day fighter and a light bomber. Model sports four 20 m.m. cannons. Span 30". C-D "Master" Kit SF-78 ..... **$3.00**

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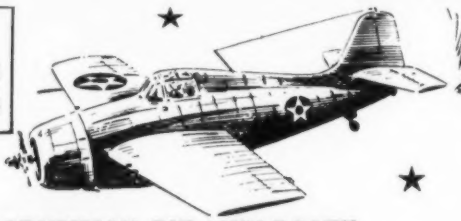

GRUMMAN F4F "WILDCAT"
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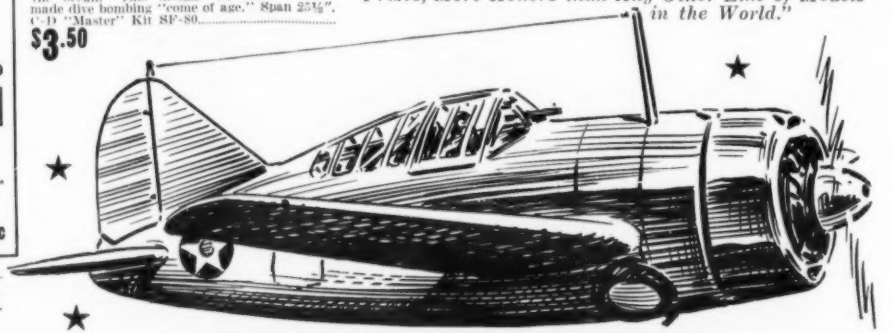

BREWSTER F2A "BUFFALO"

This fighter is widely employed by both the British and Dutch, also known as "Peanut Special." It is doing a tremendous amount of work over the Pacific. Span 26¼". C-D "Master" Kit SF-87 ..... **$3.00**

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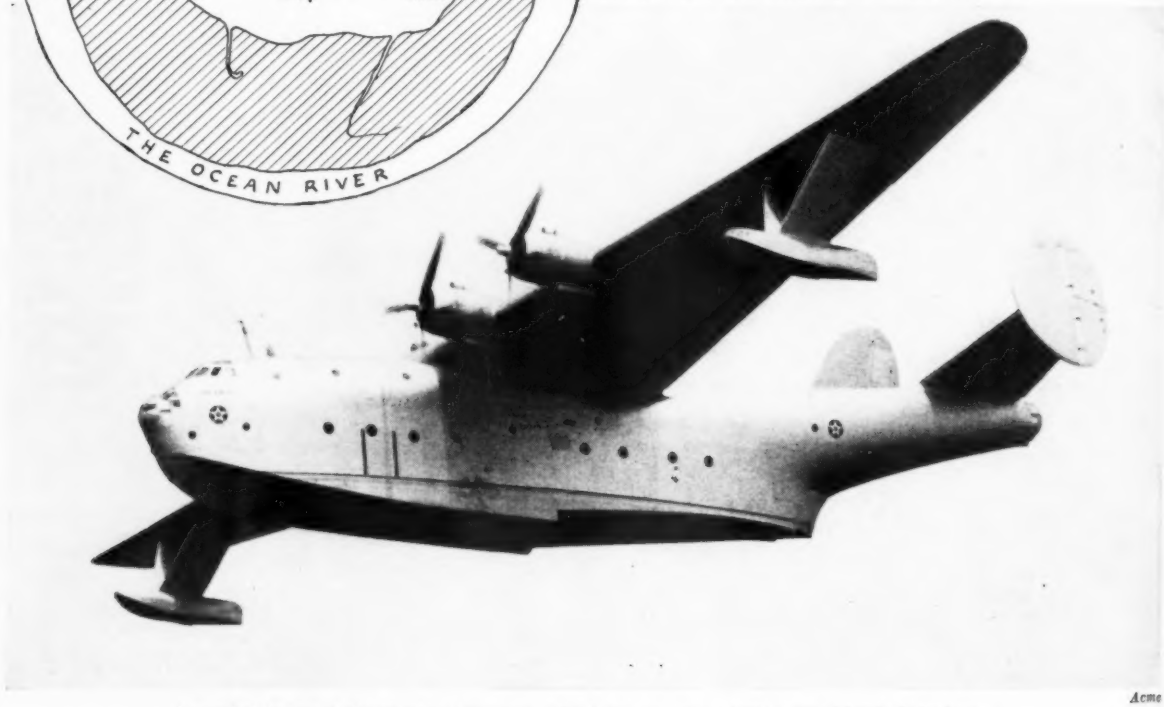
"THE MODELS THE MEN IN THE AIR FORCES BUILD"

AIR AGE GEOGRAPHY

Prepared by the Civil Aeronautics Administration

(Left) The world according to Homer: 900 B.C.



Acme

A new bright star in the aviation firmament—the Mars new 70 ton 200 ft. span Martin flyingboat—typifies the Air Age that pools the seven seas

MAPS are not geography, any more than maps are history, or philosophy, or economics. All of these things can be shown *on* maps, but that does not make them synonymous with maps. On the contrary maps are only devices for visual education; they are educational instruments of a *general* character. As such they are only pictures of what is in man's head and whatever he wishes to portray cartographically. If what is in man's head is wrong or misleading, then any map made by him is wrong or misleading.

Insofar as maps are related to geography, and some of them are in some ways related to geography, they are only diagrams of what man thinks is his geography. If man changes his ideas he has to make a different diagram. Every time man invents something he helps to create a new geography of his nation, of his state or of the world.

The airplane was such an invention. It was one of those inventions which required that men have new ideas, and these in turn required man to make a new diagram of his world. Indeed the airplane was one of the most important single inventions ever made in terms of what it did to man's ideas. Actually it created a new geography of the United States, of North America and of the world.

A map of the world according to Homer is shown on map 1. The world is flat like a phonograph disc, or a wafer. This was a wafer world. It consisted of part of what we now call Europe, part of Asia and part of what is now Northern Africa, arranged around the Mediterranean Sea. Around the edge of this big disc or wafer flowed what was called the Ocean River.

Within that world diagram a civilization existed as good as ours in many respects; in mechanical respects, far inferior. All around the periphery of the Mediterranean Sea were settlements by the Phoenicians, Greeks and their contemporaries. The islands of that sea were things to be fought over, peninsulas, promontories, capes, Scylla and Charybdis, all of those strategic places from Troy to the Pillars of Hercules. They were the things that naval, commercial, military and intellectual strategy were based on. This was a wafer world; it was flat; it had a river around the edge, in the middle lay a sea and a rim of land around it.

In 1492 Christopher Columbus boldly sailed out of a little port in Spain and voyaged westward. He left behind him the east and he arrived in the west; finding new land which was not part of the original wafer. Thereupon, men's orthodox geographical ideas fell to pieces all at once and a new concept of the world appeared.

Columbus' voyage was a trans-oceanic trip and it immediately rendered small sailing vessels out of date. Also man's concept of a world centered about the Mediterranean was made out of date.

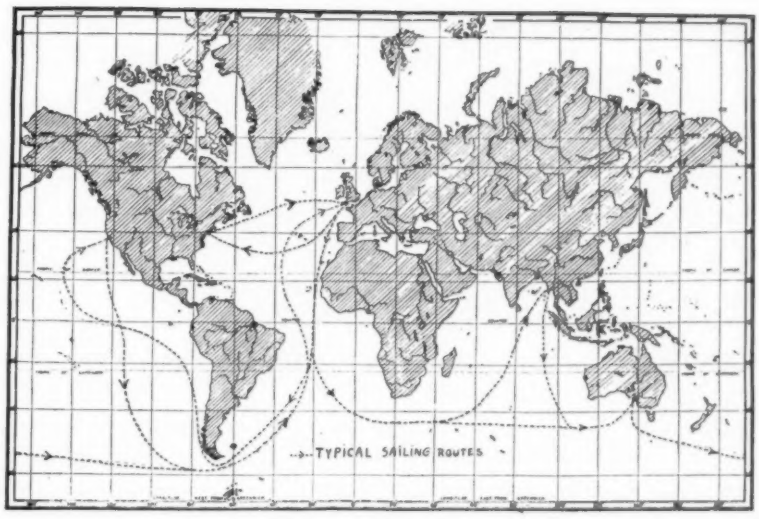
Very shortly after Behaim made a small globe to serve as a world model. From that globe men attempted to make maps to show the new geography.

Every existing world map was immediately obsolete and we had to have a new one. He arrived at the new map by taking a sheet of parchment, wrapping it around the globe and making its length equal to the globe's perimeter or circumference, and its width equal to the distance between its poles. Then the shadow of the lands and seas on that globe were projected on the parchment. The latter was then split and unrolled, giving us the familiar cylindrical map. We have come to call the commonest map of this kind the Mercator Map (map 2), in honor of one of the early map makers.

After 1492 man ceased to live on a wafer and began to live on a cylinder, no longer designing his most important vessels to fit Mediterranean conditions. Naval architecture changed; sailing vessels were designed for the open ocean.

In the era which followed, i.e., the era of trans-oceanic relations, world geography became cylindrical. Now on any cylindrical map there is obviously a Western Hemisphere and an Eastern Hemisphere. Connecting the two there developed a whole series of trade routes running every-which-way across the oceans. These routes were long; vessels were slow and time consumed in making these voyages was great. Consequently, all island stopping-points along the way became important.

A 400-year scramble to control the islands of the seven seas ensued. There was first, of course, the struggle to colonize the Western Hemisphere (the western end of the world cylinder) and then a struggle for control of the islands along the routes running from the world's old end to the new end. These islands, as colonies, were fought over in war after war, and we may trace through history their exchange. Nation after nation arose as a holder, collector, dominator of islands. All of this, of course, looked like a final geographical picture of the world.



Mercator's Projection

It looked so permanent that the American people got a two-hemisphere, island-possession complex deeply fixed in their minds.

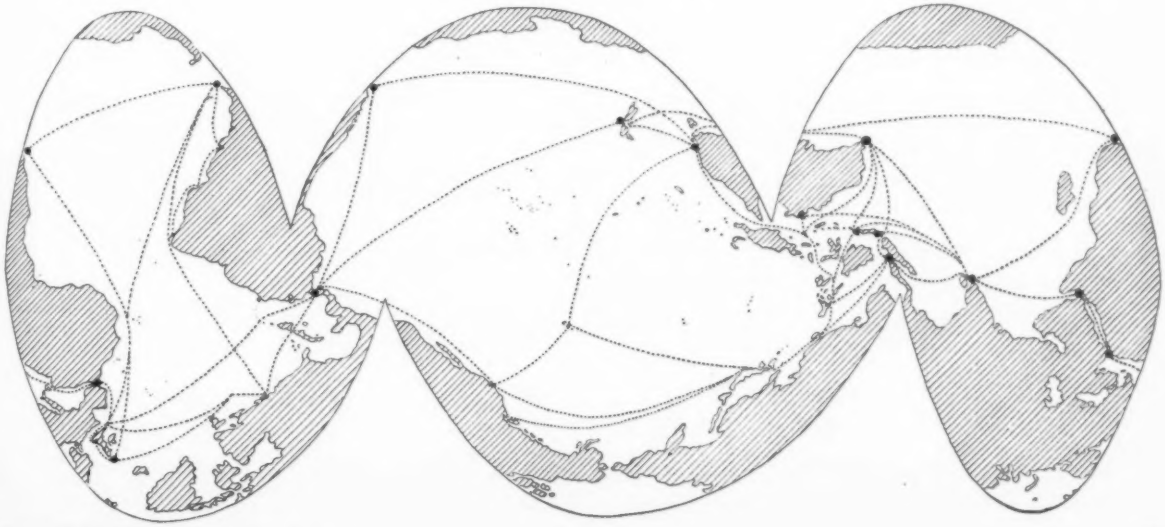
With the invention of a steel power-driven ship speed became the essence of things; wandering sailing vessel routes over the seven seas became outmoded. No longer did man think of the world in terms of a slow ship following along a series of islands from one end of a cylinder to the other. Soon long voyages around the Horn or around the Cape of Good Hope became outmoded, for speedy, power-driven ships became independent of wind belts and island stops. We developed regular schedules of travel along definite sea lanes. Considerations of speed became so important that if we could pare off a few hours we were often willing to risk the safety of a ship; the Titanic disaster was a good example of what sometimes happened in trying to cut schedules by a few hours.

In developing new lanes of commerce an old but forgotten discovery became considerably important. That is, the shortest distance between two points on the globe was usually not a straight line on the cylindrical map. Instead, the shortest distance between any two places on the earth is actually found by drawing an equator through them (that is, a full 25,000 mile circle through them. This is a full earth circumference line, or, a great geometric circle). When such a line on a globe is transferred to a Mercator map it is not a straight line but a very curved one; it looks like a long roundabout way between two points rather than the shortest route. The cylindrical map shows both lands and oceans pulled clear out of proper shape and in places enormously exaggerated in size. Obviously such a map could not show a picture of a world based upon streamlined ocean trade around the edges of the ocean basins.

The misfitting of great circle routes on a Mercator map should have given us a

(Continued on page 52)

Equal-Area Ocean Basin Map



MODELING YOUR FUTURE IN AVIATION

Official Air Youth course in elementary aeronautics

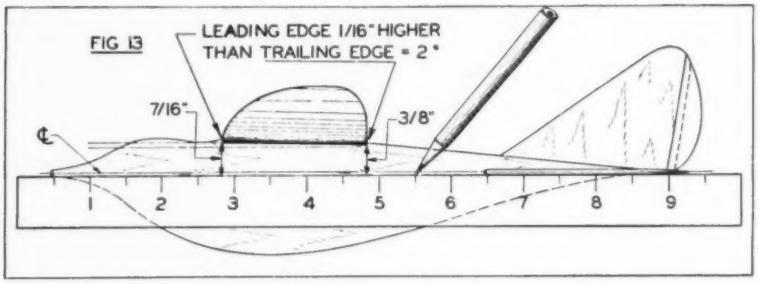
by **CHARLES H. GRANT**

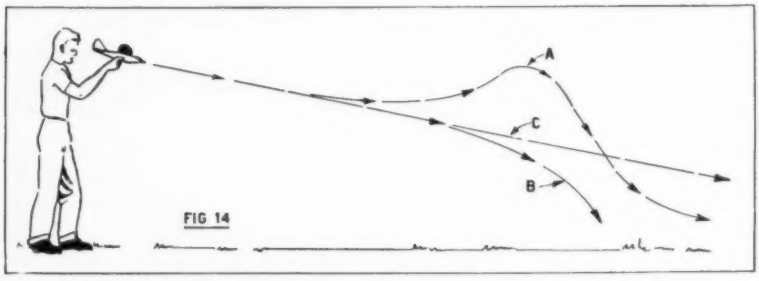
ARTICLE 3

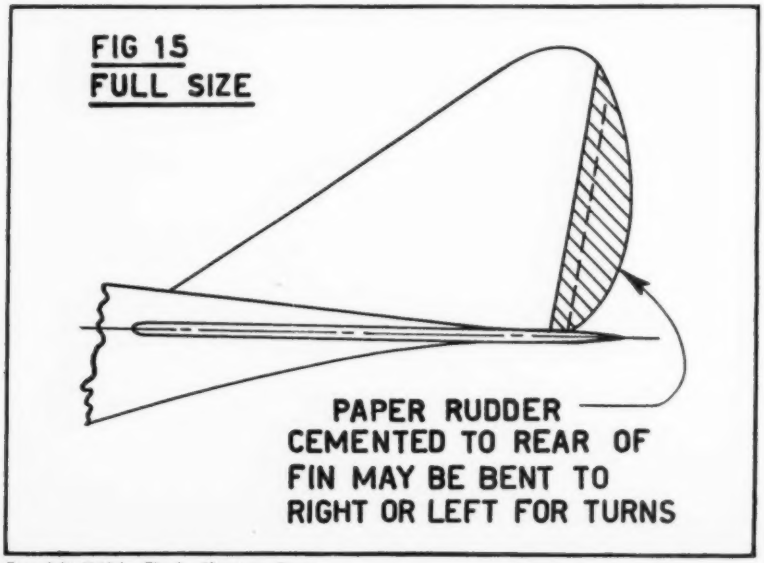
How to Adjust and Fly the Primary Bird Glider . . Building a Scale Army O-52 Model Glider.

THE happiest moment in the life of a model builder, but the most dangerous for the model, comes when final building operations are completed. Anticipation swells to unrestrainable proportions as the final part is cemented in place. Hardly is the cement or decoration on its carefully fashioned surfaces dry before the plane is launched on its aerial career by an over-anxious creator. But this procedure results from the lack of experience—sad experience that has taught old hands never to attempt a flight before the invisible but vital requirements, plus the obvious structural elements, are carefully checked. The glider's success and span of life depends upon this final important step.

So after completing the structure, sit down, calm your enthusiasm and repress that impulse to risk a disastrous flight. Before you can be assured of perfect flight your bird glider must be carefully balanced, wing angles and tail checked and adjusted.







First, balance the glider by supporting it on two fingers under the wing close to the fuselage. When the approximate point of balance has been determined stick a pin through the body 1/4" below the wing, approximately at the point of balance. Now test the balance, supporting the model by the ends of the pin. If it noses down pull the pin out and insert it slightly ahead of its former position, again testing its balance. Change the position of the pin until the exact position is found.

Now look at the plan given last month. If this point is slightly ahead of that shown on the plan, less weight is required in the nose; if to the rear, more weight should be added. An additional weight may be inserted beneath the bird's bill, by making a hole with an awl, then inserting a small nail or piece of metal and gluing in place. Nail size may be determined by first inserting it in the hole loosely and then balancing the glider.

The second step in checking is to determine the angle between the wing and stabilizer, and make the necessary adjustments. This is the most important step of all.

To determine this angle place a ruler alongside the body with its upper edge parallel with and tight up against the underside of the stabilizer, as shown in Fig. 13. The edge of the ruler will be slightly below the line drawn from the stabilizer to the point of the bill. Draw a line on the side of the fuselage along the upper edge of the ruler, as indicated.

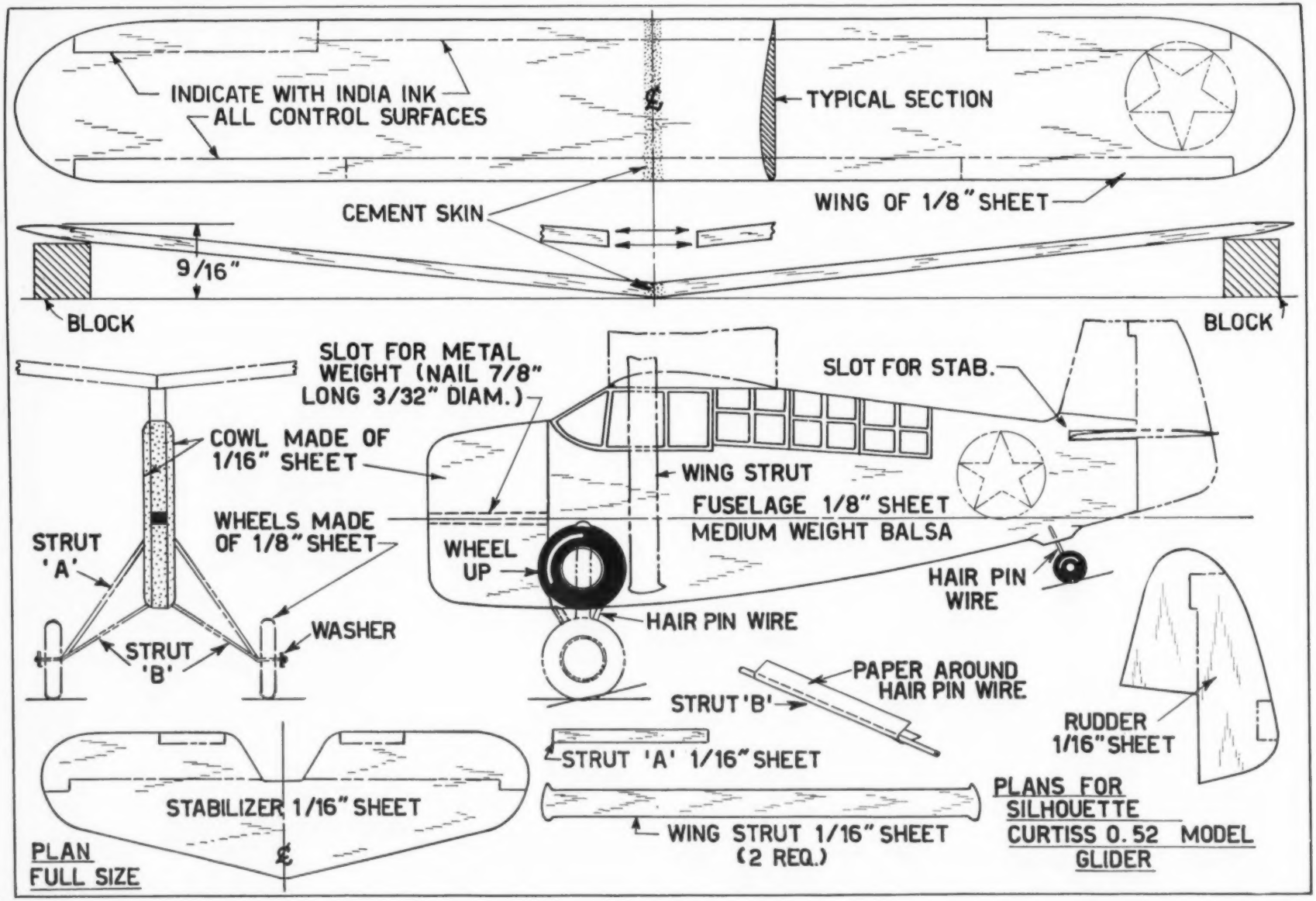
Now measure the distance from this line to the trailing edge; it should be approximately 3/8". Next measure the height of the leading edge above the line. In any case this should be exactly 1/16" more. If the trailing edge distance is 3/8" the wing leading edge should be 7/16" above the line. This rise of 1/16" when the wing chord is 2" gives a wing angle of plus 2 degrees more than the stabilizer. In normal flight, stabilizers on gliders pass through the air at zero degrees; parallel to the line of normal flight. Consequently the wing moves at an angle of plus 2 degrees. This angle measured relative to line of flight, in this case the axis of the fuselage parallel with the stabilizer, is the wing angle of incidence.

If the wing leading edge is not exactly 1/16" higher than the trailing edge the stabilizer may be curved slightly upward or downward, whichever is required to produce this difference in angle between stabilizer and wing.

Curve the wood by warming it with your hand and gently bending its rear edge up or down. Repeat this operation until the stabilizer stays in the desired shape.

If you have followed the plans carefully the wing angle should be accurate. Another

Copyright 1942 by Charles Hampson Grant


INDICATE WITH INDIA INK
ALL CONTROL SURFACES
TYPICAL SECTION
CEMENT SKIN
WING OF 1/8" SHEET
9/16"
BLOCK
BLOCK
SLOT FOR METAL WEIGHT (NAIL 7/8" LONG 3/32" DIAM.)
SLOT FOR STAB.
COWL MADE OF 1/16" SHEET
WING STRUT
FUSELAGE 1/8" SHEET MEDIUM WEIGHT BALSA
WHEELS MADE OF 1/8" SHEET
STRUT 'A'
WHEEL UP
HAIR PIN WIRE
HAIR PIN WIRE
WASHER
STRUT 'B'
PAPER AROUND HAIR PIN WIRE
STRUT 'B'
RUDDER 1/16" SHEET
STRUT 'A' 1/16" SHEET
STABILIZER 1/16" SHEET
WING STRUT 1/16" SHEET (2 REQ.)
PLAN FULL SIZE
PLANS FOR SILHOUETTE CURTISS 0.52 MODEL GLIDER

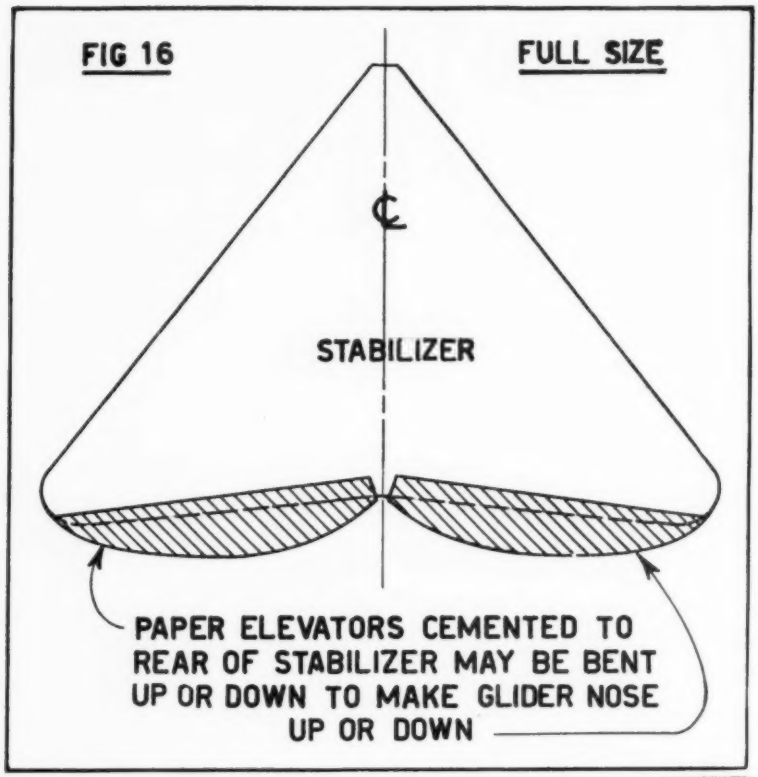
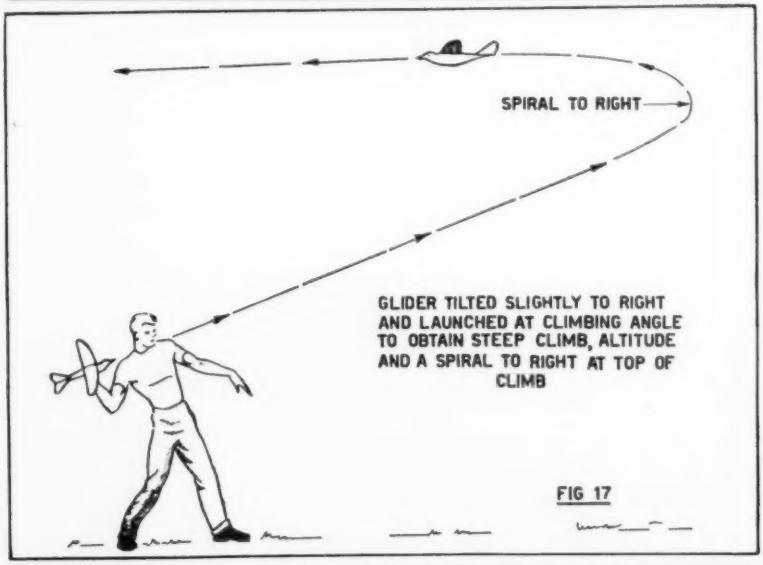
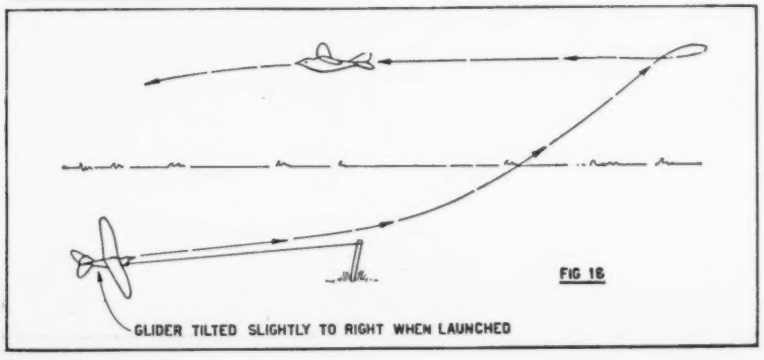


FIG 16
FULL SIZE
STABILIZER
PAPER ELEVATORS CEMENTED TO REAR OF STABILIZER MAY BE BENT UP OR DOWN TO MAKE GLIDER NOSE UP OR DOWN


SPIRAL TO RIGHT
GLIDER TILTED SLIGHTLY TO RIGHT AND LAUNCHED AT CLIMBING ANGLE TO OBTAIN STEEP CLIMB, ALTITUDE AND A SPIRAL TO RIGHT AT TOP OF CLIMB
FIG 17



way of adjusting the angle is to remove the wing, cut the wing seat of the fuselage to the correct angle and then glue the wing back in place.

This angle is so important because this particular feature of an airplane gives it longitudinal stability, reducing the tendency to stall or dive. If the plane noses up into a stall the stabilizer passes through the air at a positive instead of a neutral angle, the air striking its underside to create lift. The increase in the wing angle also increases lift, but this is small compared to the increased lift on the stabilizer, so the pressure under the stabilizer pushes up the tail and brings the plane back to normal flight.

The reverse occurs if the glider noses down suddenly; that is, air strikes the top of the stabilizer, forcing it down and nosing the glider up into normal flight. In this way the difference in angle between wing and stabilizer generates correcting forces and all airplanes, large and small, operate on this principle.

When satisfied that the angle is correct line up the wings by sighting along the fuselage from a point one foot ahead of the bill. Hold the glider at that angle from which you can see a small part of the undersurface of the wing. If the wings are properly aligned an equal amount of the undersurface will be seen on both sides.

Sometimes the wings are twisted, the underside of one showing more than the other. Then it becomes necessary to twist them, after heating them in your hand, so they will be alike on both sides. If less of the underside of one wing shows the wing angle at that point is too small. The wing should be twisted so the trailing edge is lowered and the leading edge raised.

Next sight along the fuselage top and make sure that the fin is straight and not twisted; it should be absolutely parallel with the fuselage. Curve it one way or the other to straighten it.

Now the exciting moment arrives—your glider is ready for its first test flight. Best results are obtained by approaching the problem cautiously. For instance, do not attempt to make the first flight over concrete pavements, in the street, or where there are obstacles; if possible choose some large open space where the grass is fairly long, to cushion landings.

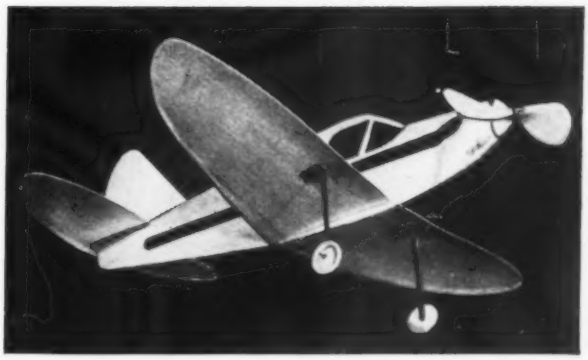
Direction of the wind is also important; if the glider is launched cross-wind no one can predict where it will land; if launched down-wind it is necessary to throw it with considerable force to provide sufficient flight speed. Obviously the faster a plane flies when it hits an object the greater the damage done; therefore make the first test flight against the wind.

Hold the glider by the fuselage directly under the wing, about on a level with your eye and to the side. The wing should be horizontal and the nose tilted slightly downward. The correct launching position is shown in Fig. 14.

Now you are ready for the first flight. Be sure the nose is pointed slightly downward; then toss the glider gently forward in a straight line, releasing it along the path shown in the diagram. If it follows path C, gliding straight and steadily to a gentle landing, your glider is in perfect flight ad-

(Continued on page 50)

FLYING SCALE FOR BEGINNERS



A simplified flying scale model of a Culver Cadet sportplane that can be built ready to fly in less than three hours.

by REX HALL

OF ALL the sportplanes now gaining popularity the new Culver 41 two-seater rates high in its class. Powered with either a 75 hp. Continental or 80 hp. Franklin its performance is exceptional.

Other features are: electric starter, hydraulic brakes and retractable landing gear. Performances obtained by the 80 hp. engine are as follows: High speed, 140 mph; climb at sea level, 800 ft. per minute; service ceiling, 17,500 ft.; landing speed, 45 mph.

To simplify the model and to save the builder time and expense, the Culver has been reproduced in profile form. This does not take away from flying capacity but instead adds to flying hours with minimum repairs.

The model is accurate in all respects, except for those usual changes that are vital to good stability. Indeed, the performance of the Culver in model form is characteristic of the original ship.

CONSTRUCTION: Begin by constructing the fuselage. First, the fuselage pattern may be transferred on a piece of 1/16″ sheet of hard balsa. Buy wood of a stringy grain; this is usually stronger. When the true fuselage contour has been cut out, lay it down on a flat surface and cut out the sections indicated on the drawing. Sections which have to be cut out are the cabin, wing and motor channel.

Next, the cabin contour may be completed by adding the 1/16″ x 3/32″ piano wire brace and celluloid windshield pieces, one on each side.

The nose blocks are constructed of 1/4″ sheet balsa, placed on each side of the nose, and later cut to the correct contour. The nose plug may be cut from 1/4″ sheet balsa, using very hard balsa. The correct nose plug shape is obtained by lightly gluing on a piece of 1/4″ sheet balsa. Let this piece dry, then cut the correct contour. Later remove this piece and add a piece of 1/16″ sheet to form the rear end of the plug through which the propeller shaft extends. The slot marked A on the drawing may be removed by wrapping a piece of sandpaper around a nail and using it as a rat-tail file.

Make two clips of No. 14 size piano wire; these are cemented to each side of the fuselage spanning the motor channel. These braces hold the fuselage in position when the model is fully wound. The propeller shaft is bent to the required size on the drawing, using No. 14 wire. The rear hook is also of No. 14 piano wire; use a little more glue than usual on this when fastening it to the body.

WING AND TAIL SURFACES: The wing is of simple construction, cut from a piece of 1/32″ sheet balsa. Trace the pattern onto the balsa. Wings are cut out in two sections which are later joined at the center; it's best not to join them until ready to assemble. Be sure to sand each wing panel thoroughly, then lay it aside and start on your next assembly.

The tail assembly is also constructed of 1/32″ sheet medium-hard balsa. Take care while cutting out the sections to prevent splitting the wood. The rudder is simply cut, the bottom matching the fuselage contour.

The model in flight (it is easily repaired when broken)

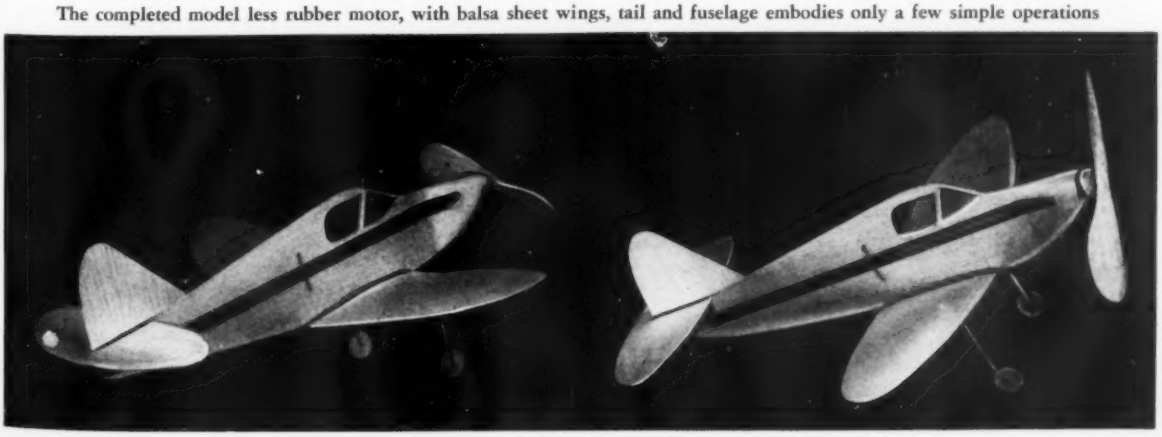
The stabilizer is made in one piece, a small notch is cut out in the center enabling the stabilizer to be slipped in position at the fuselage rear. A complete plan view and method of assembly is shown on the drawing.

LANDING GEAR: The landing gear is shown on plate 1, consisting of two single pieces of No. 14 piano wire. Place the required size wire over the plan view and bend into correct position, using a small pair of pincher-nosed pliers. The land gear top view is shown under the wing panel; this indicates the method in which the gear is held in position. Wheels are not added until the plane is completely assembled.

MOTOR: The propeller is carved from a balsa block 1/2″ x 1″ x 6″ and finished

(Continued on page 64)

The completed model less rubber motor, with balsa sheet wings, tail and fuselage embodies only a few simple operations



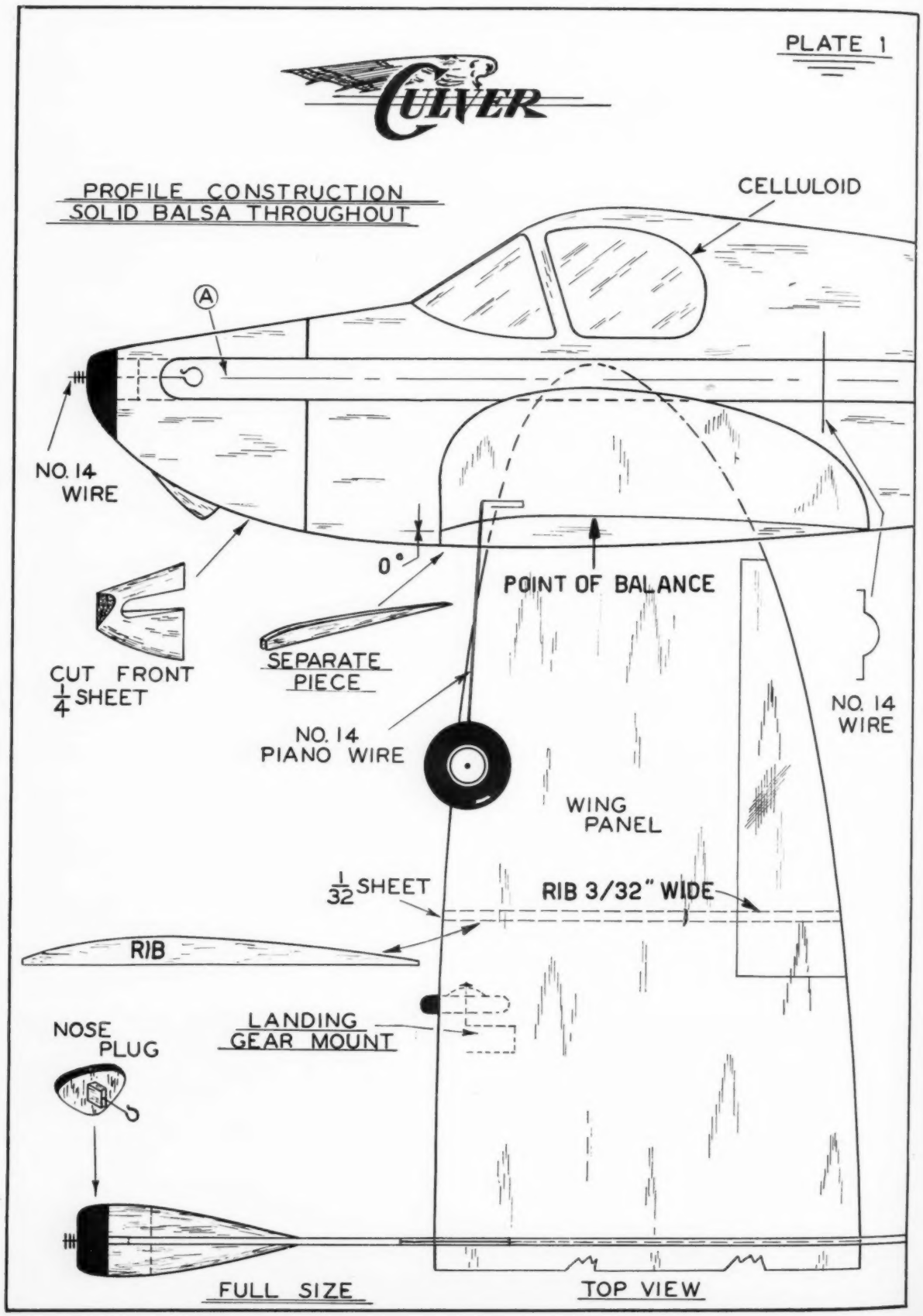


PLATE 1
CULVER
PROFILE CONSTRUCTION
SOLID BALSA THROUGHOUT
CELLULOID
A
NO. 14
WIRE
0°
POINT OF BALANCE
CUT FRONT
1/4 SHEET
SEPARATE
PIECE
NO. 14
PIANO WIRE
NO. 14
WIRE
WING
PANEL
1/32 SHEET
RIB 3/32" WIDE
RIB
NOSE
PLUG
LANDING
GEAR MOUNT
FULL SIZE
TOP VIEW

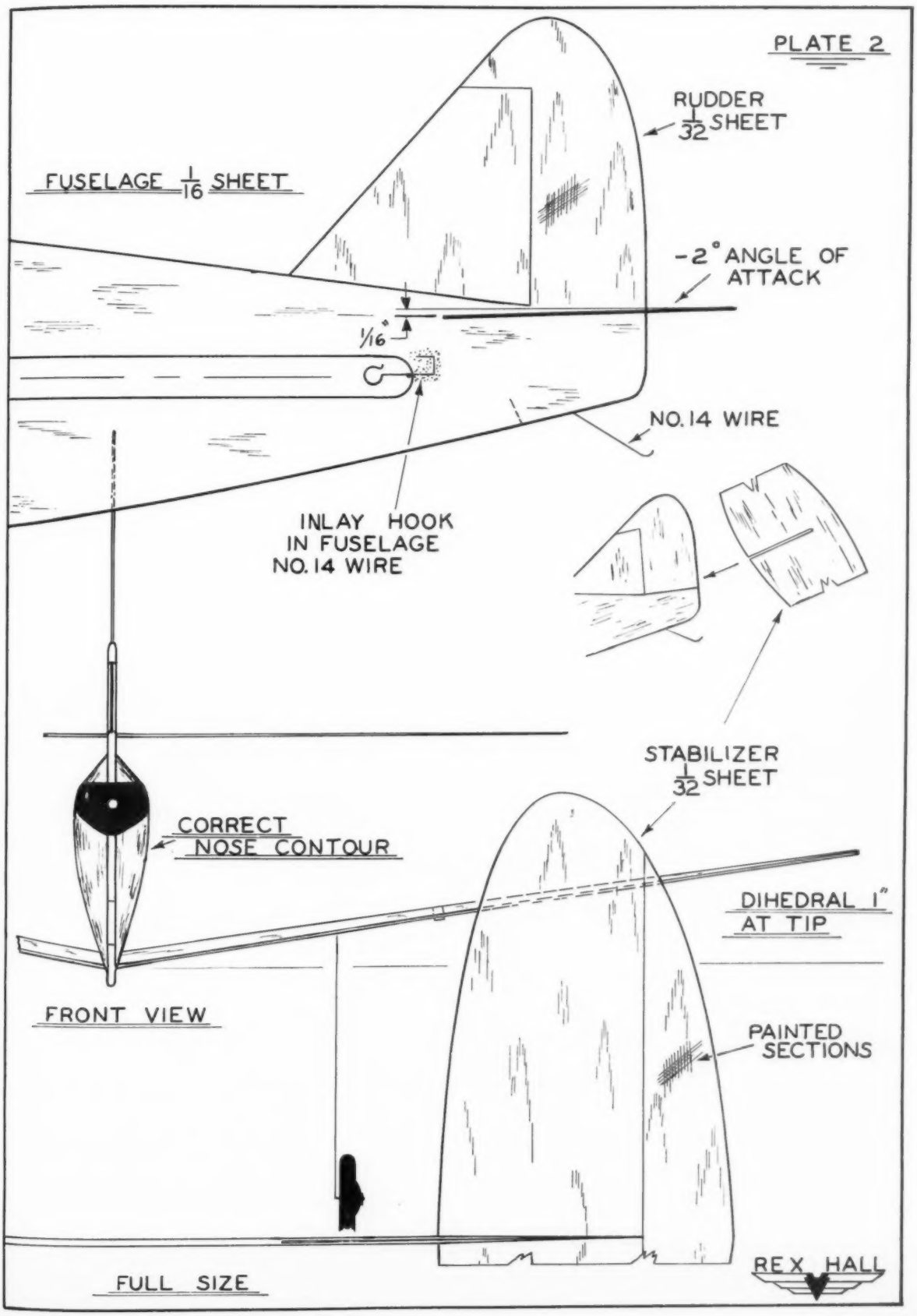


PLATE 2
RUDDER 1/32 SHEET
FUSELAGE 1/16 SHEET
-2° ANGLE OF ATTACK
1/16"
NO. 14 WIRE
INLAY HOOK IN FUSELAGE NO. 14 WIRE
STABILIZER 1/32 SHEET
CORRECT NOSE CONTOUR
DIHEDRAL 1" AT TIP
FRONT VIEW
PAINTED SECTIONS
FULL SIZE
REX HALL

A gas model equipped with the automatic pilot is completely stable even though no dihedral is used. (Right) Plane in actual flight.

THE PHANTOM PILOT TAKES COMMAND

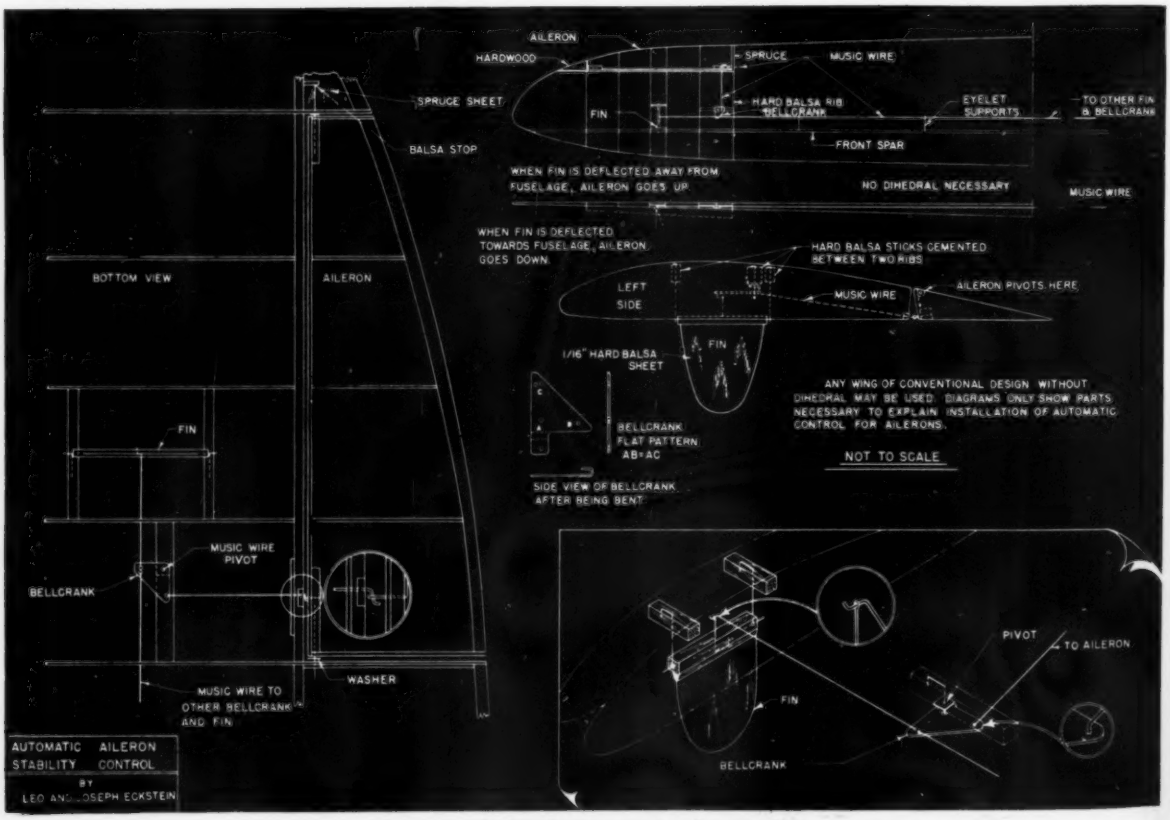
How to stabilize your model with a simple automatic pilot

by **JOSEPH** *and* **LEO ECKSTEIN**

MOST model builders have harbored visions of their models flying in heavy gusty winds as well as on calm spring days. The majority of them, however, have been sadly disillusioned after their initial vain attempts, and, consequently, grimly resigned themselves to await some distant sunny day when there would be nothing more than a few stray breezes gently floating through the air. Then, and only then, would they feel completely safe in venturing out with their prized models with the full expectation of carting them back intact.

But the day of reckoning has now approached! The antiquated fair weather model is now a part of the ancient past: and in its place has evolved the plane

(Continued on page 39)



Arrangement of mechanism in wing framework.

GAS MODEL ARMY SCOUT

A scale model of the Curtiss O-52 observation plane that is easy to build—and a most consistent flier

by SYDNEY STRUHL

THIS month we are presenting a most unusual gas model—a truly scale version for either Class A or Class B motors of the United States Army's new eyes: The Curtiss O-52 observation ship.

The Curtiss O-52 is the Army's latest flying "greenhouse" used extensively for observation and reconnaissance work, artillery spotting, and on photographic missions. The crew consists of two: the pilot and observer. Naturally the ship's performance and other details are Army secrets, but it is said the O-52 is considered one of the most efficient aircraft of its type in the world.

After glancing at the pictures of the Curtiss O-52 you can readily tell that this type of plane would make the ideal scale gas model. And believe us it does!

The general setup of the whole plan lends itself to a very stable model. The high wing, ample dihedral, large tail surface area, well placed thrust line, and a rather nice setup of all forces such as the center of gravity and center of lateral area, etc., all combine to present a very pleasing picture of what the well-flying gas model is sporting this year.

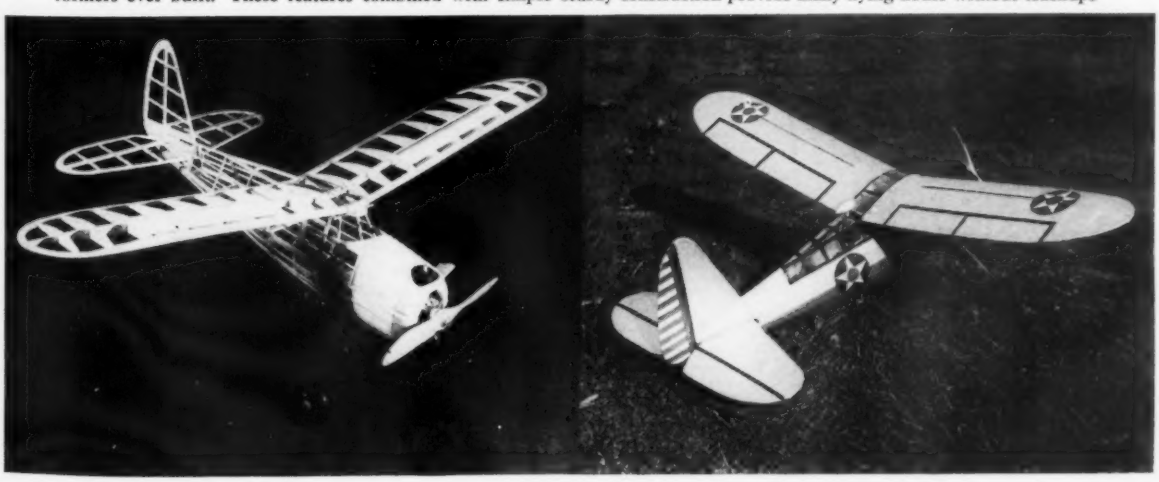
Certain structural features are well-noted, too. The landing gear placed well forward insures fine landings and prevents broken propellers. The fuselage design allows us to employ the well known "crutch construction" that simplifies fuselage construction to a great degree.

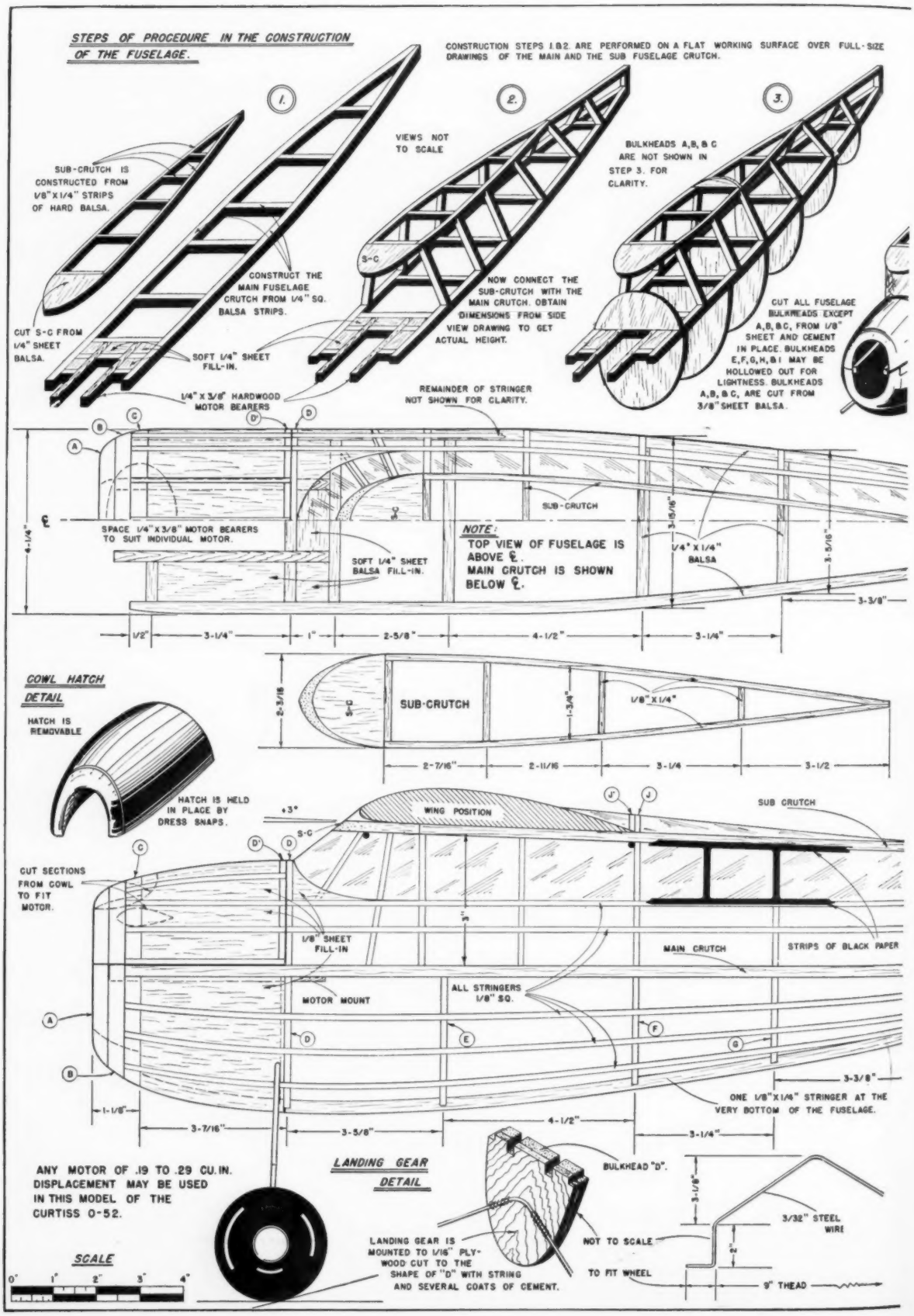
The O-52's construction may appear rather difficult at first glance, but after a little study of the plans you will realize that this model is amazingly easy to build. We have tried to keep construction easy enough for the beginner who is trying his hand at a gas model for the first time.

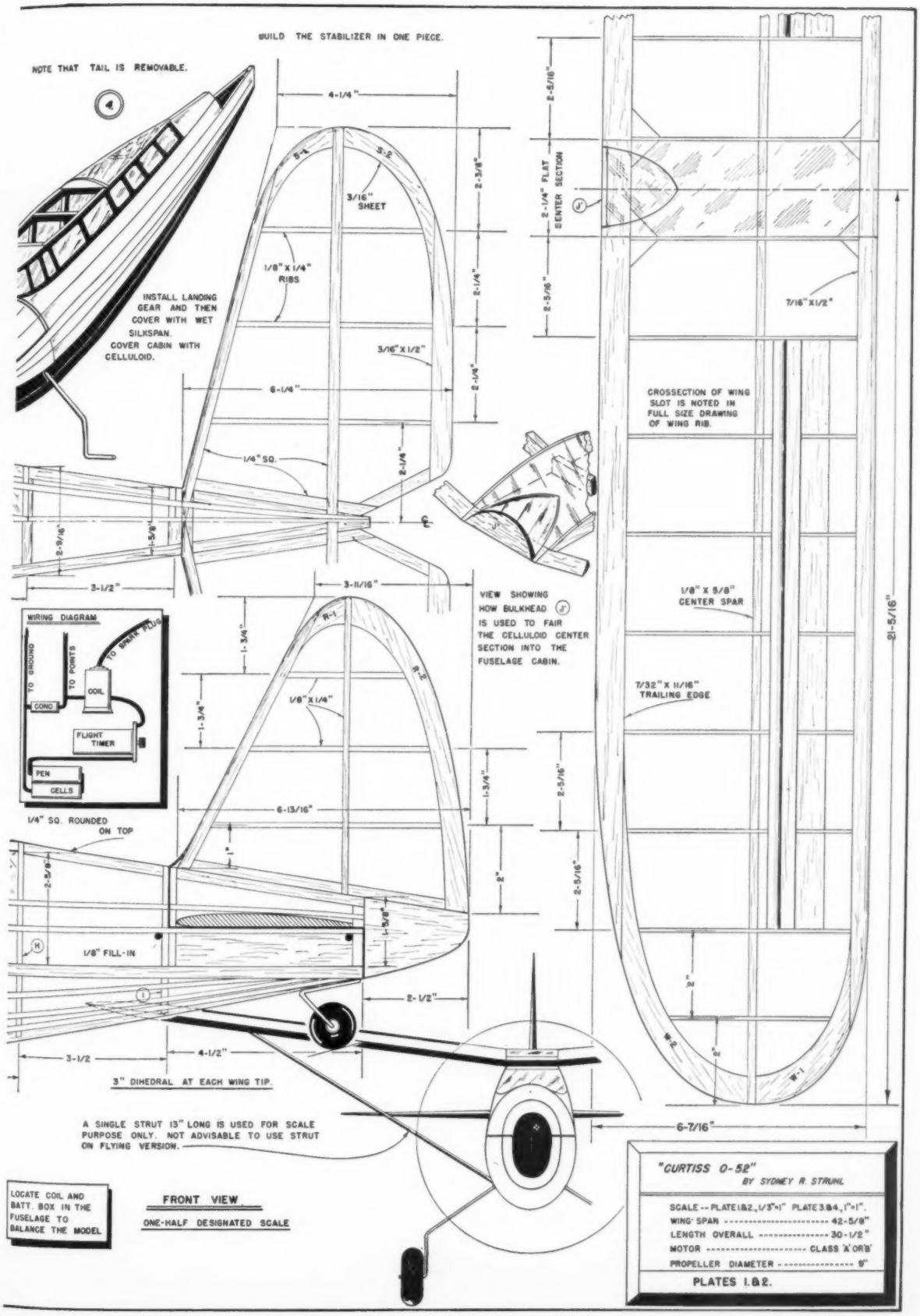
Of course one of the big features of our Curtiss scale gas model is the fact that we are employing the new Grant wing slots. There are several reasons why we decided to use these new slots in the wings. The model has a rather high wing loading which means that flights will be quite fast; naturally you don't want a sensitive model; therefore the wing slots. Although the tail surfaces were designed with plenty of area, the fuselage moment arm is rather short. When the wing slots are used they eliminate the need for a long moment to produce a stable flying model. Slots also go a long way in producing a long, flat and very slow glide. All of these facts and claims about wing slots have been proved

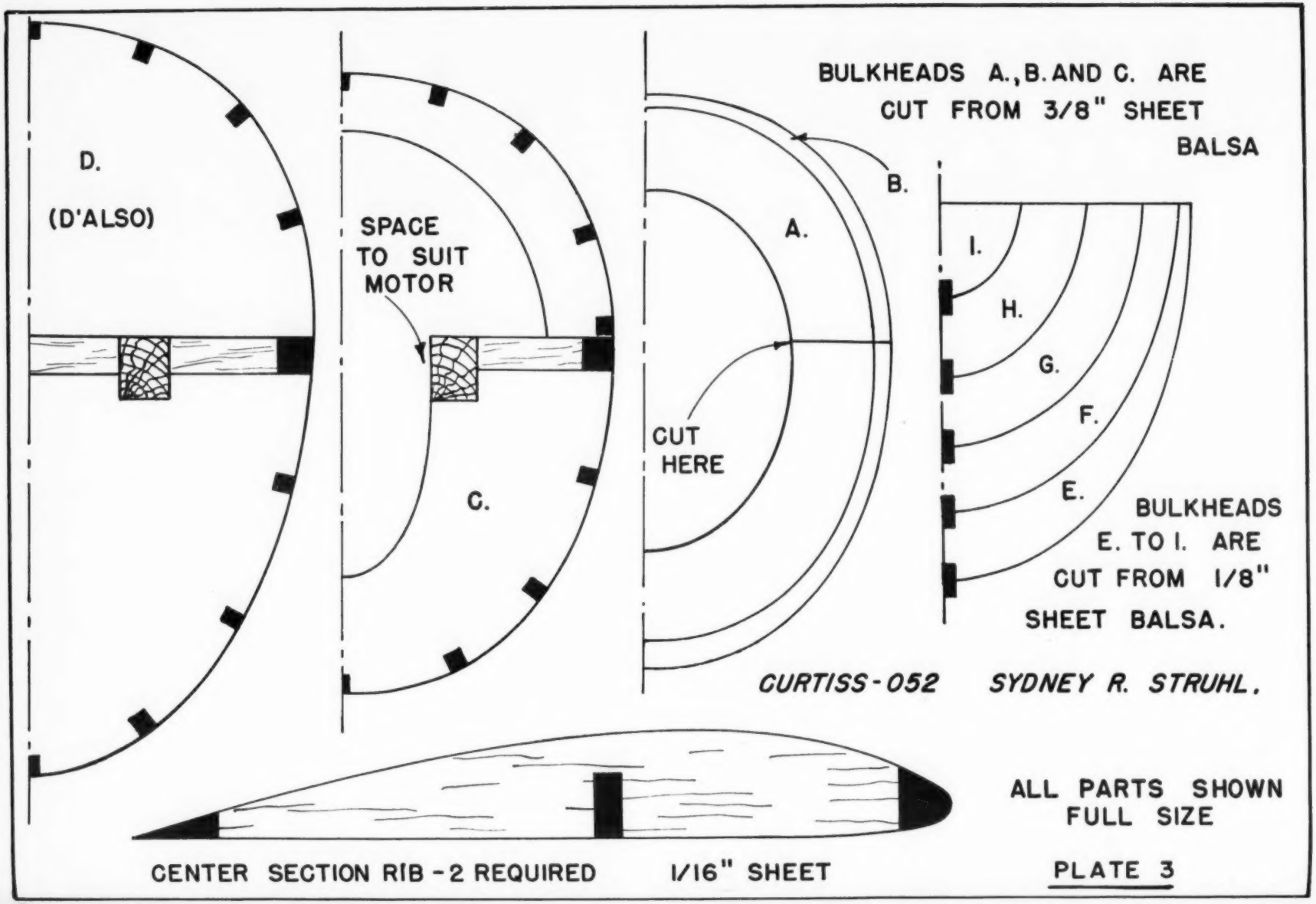
(Continued on page 36)

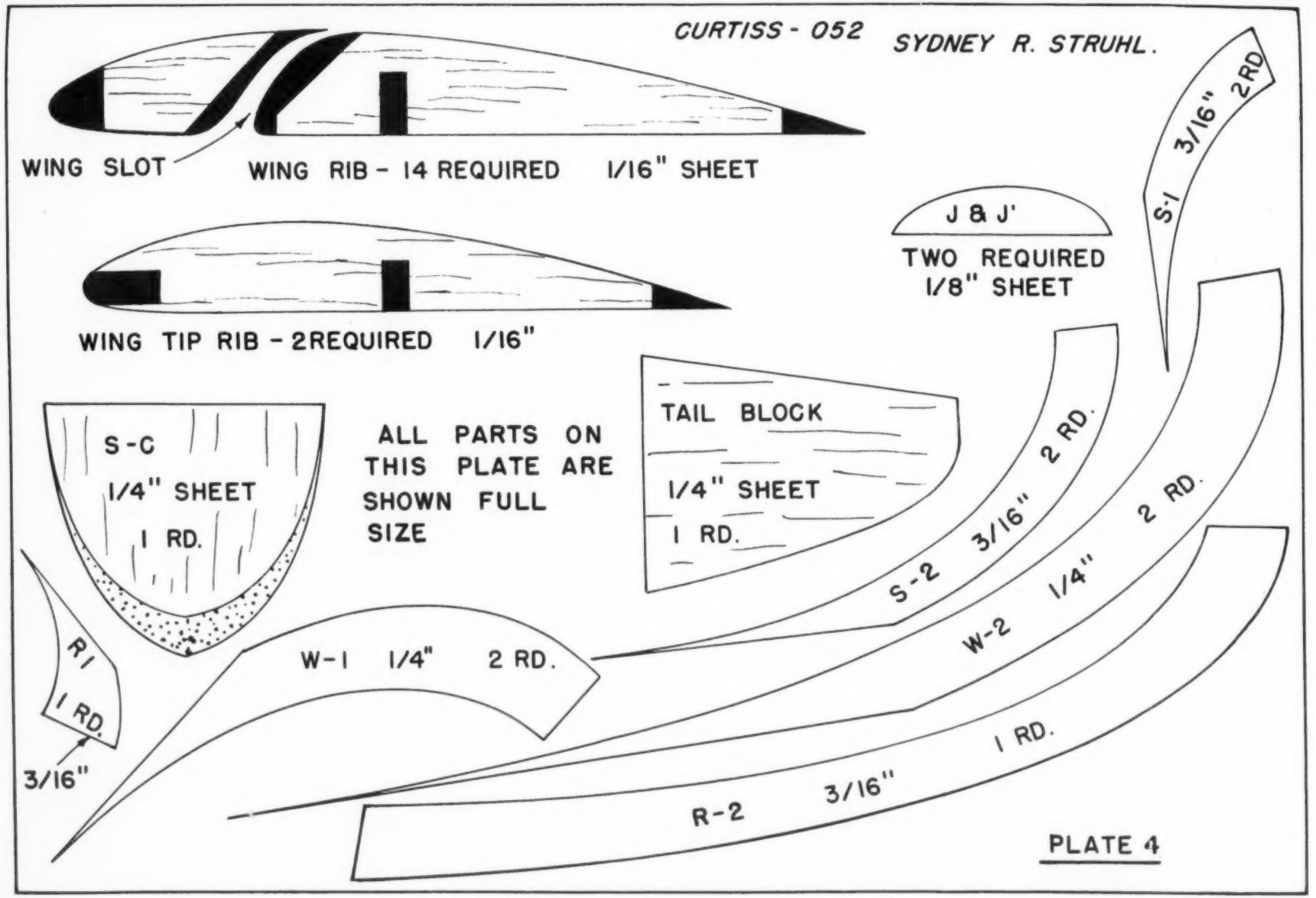
It is not only realistic, with its gas engine and scale proportions, but wing slots make it one of the most reliable performers ever built. These features combined with simple sturdy construction provide many flying hours without crackups




STEPS OF PROCEDURE IN THE CONSTRUCTION OF THE FUSELAGE.
CONSTRUCTION STEPS 1 & 2 ARE PERFORMED ON A FLAT WORKING SURFACE OVER FULL-SIZE DRAWINGS OF THE MAIN AND THE SUB FUSELAGE CRUTCH.
1.
2.
3.
SUB-CRUTCH IS CONSTRUCTED FROM 1/8" X 1/4" STRIPS OF HARD BALSA.
CONSTRUCT THE MAIN FUSELAGE CRUTCH FROM 1/4" SQ. BALSA STRIPS.
CUT S-C FROM 1/4" SHEET BALSA.
SOFT 1/4" SHEET FILL-IN.
1/4" X 3/8" HARDWOOD MOTOR BEARERS
VIEWS NOT TO SCALE
S-C
NOW CONNECT THE SUB-CRUTCH WITH THE MAIN CRUTCH. OBTAIN DIMENSIONS FROM SIDE VIEW DRAWING TO GET ACTUAL HEIGHT.
BULKHEADS A, B, & C ARE NOT SHOWN IN STEP 3. FOR CLARITY.
CUT ALL FUSELAGE BULKHEADS EXCEPT A, B, & C, FROM 1/8" SHEET AND CEMENT IN PLACE. BULKHEADS E, F, G, H, & I MAY BE HOLLOWED OUT FOR LIGHTNESS. BULKHEADS A, B, & C, ARE CUT FROM 3/8" SHEET BALSA.
REMAINDER OF STRINGER NOT SHOWN FOR CLARITY.
SUB-CRUTCH
SPACE 1/4" X 3/8" MOTOR BEARERS TO SUIT INDIVIDUAL MOTOR.
SOFT 1/4" SHEET BALSA FILL-IN.
NOTE: TOP VIEW OF FUSELAGE IS ABOVE ℄. MAIN CRUTCH IS SHOWN BELOW ℄.
1/4" X 1/4" BALSA
3-3/8"
1/2" 3-1/4" 1" 2-5/8" 4-1/2" 3-1/4"
COWL HATCH DETAIL
HATCH IS REMOVABLE
HATCH IS HELD IN PLACE BY DRESS SNAPS.
SUB-CRUTCH
1/8" X 1/4"
2-7/16" 2-11/16 3-1/4 3-1/2
WING POSITION
+3°
SUB CRUTCH
CUT SECTIONS FROM COWL TO FIT MOTOR.
1/8" SHEET FILL-IN
MAIN CRUTCH
STRIPS OF BLACK PAPER
MOTOR MOUNT
ALL STRINGERS 1/8" SQ.
ONE 1/8" X 1/4" STRINGER AT THE VERY BOTTOM OF THE FUSELAGE.
1-1/8" 3-7/16" 3-5/8" 4-1/2" 3-1/4"
ANY MOTOR OF .19 TO .29 CU. IN. DISPLACEMENT MAY BE USED IN THIS MODEL OF THE CURTISS O-52.
LANDING GEAR DETAIL
BULKHEAD "D".
LANDING GEAR IS MOUNTED TO 1/16" PLYWOOD CUT TO THE SHAPE OF "D" WITH STRING AND SEVERAL COATS OF CEMENT.
NOT TO SCALE
TO FIT WHEEL
3/32" STEEL WIRE
9" THEAD
SCALE
0" 1" 2" 3" 4"


BUILD THE STABILIZER IN ONE PIECE.
NOTE THAT TAIL IS REMOVABLE.
INSTALL LANDING GEAR AND THEN COVER WITH WET SILKSPAN. COVER CABIN WITH CELLULOID.
4-1/4"
3/16" SHEET
1/8" X 1/4" RIBS
3/16" X 1/2"
6-1/4"
1/4" SQ.
2-3/8"
2-1/4"
2-1/4"
2-1/4"
2-9/16"
2-5/8"
3-1/2"
3-11/16"
2-5/16"
2-1/4" FLAT CENTER SECTION
2-5/16"
7/16" X 1/2"
CROSSECTION OF WING SLOT IS NOTED IN FULL SIZE DRAWING OF WING RIB.
VIEW SHOWING HOW BULKHEAD (J) IS USED TO FAIR THE CELLULOID CENTER SECTION INTO THE FUSELAGE CABIN.
1/8" X 5/8" CENTER SPAR
7/32" X 11/16" TRAILING EDGE
21-5/16"
WIRING DIAGRAM
TO GROUND
TO POINTS
TO SPARK PLUG
COIL
COND.
FLIGHT TIMER
PEN
CELLS
1-3/4"
1-3/4"
1/8" X 1/4"
1-3/4"
2-5/16"
6-13/16"
1/4" SQ. ROUNDED ON TOP
1"
2"
2-5/16"
2-5/8"
1-5/8"
1/8" FILL-IN
2-1/2"
3-1/2
4-1/2"
3" DIHEDRAL AT EACH WING TIP.
A SINGLE STRUT 13" LONG IS USED FOR SCALE PURPOSE ONLY. NOT ADVISABLE TO USE STRUT ON FLYING VERSION.
6-7/16"
LOCATE COIL AND BATT. BOX IN THE FUSELAGE TO BALANCE THE MODEL
FRONT VIEW
ONE-HALF DESIGNATED SCALE
"CURTISS O-52"
BY SYDNEY R. STRUHL
SCALE -- PLATE 1&2, 1/3"=1" PLATE 3&4, 1"=1".
WING SPAN ---------- 42-5/8"
LENGTH OVERALL ---------- 30-1/2"
MOTOR ---------- CLASS 'A' OR 'B'
PROPELLER DIAMETER ---------- 9"
PLATES 1 & 2.


D.
(D'ALSO)
SPACE
TO SUIT
MOTOR
C.
A.
B.
CUT
HERE
I.
H.
G.
F.
E.
BULKHEADS A., B. AND C. ARE
CUT FROM 3/8" SHEET
BALSA
BULKHEADS
E. TO I. ARE
CUT FROM 1/8"
SHEET BALSA.
CURTISS-052
SYDNEY R. STRUHL.
ALL PARTS SHOWN
FULL SIZE
CENTER SECTION RIB - 2 REQUIRED
1/16" SHEET
PLATE 3


CURTISS - 052
SYDNEY R. STRUHL.
WING SLOT
WING RIB - 14 REQUIRED
1/16" SHEET
WING TIP RIB - 2 REQUIRED
1/16"
J & J'
TWO REQUIRED
1/8" SHEET
S-1 3/16" 2RD
S-C
1/4" SHEET
1 RD.
ALL PARTS ON THIS PLATE ARE SHOWN FULL SIZE
TAIL BLOCK
1/4" SHEET
1 RD.
S-2 3/16" 2 RD.
W-2 1/4" 2 RD.
R1
1 RD.
3/16"
W-1 1/4" 2 RD.
R-2 3/16" 1 RD.
PLATE 4

AIR YOUTH

(A Division of the National Aeronautic Association)

Official Model Airplane News Prepared by Al Lewis

Model Aviation is a War Aid

DURING a recent visit to Toledo, Ohio, Dr. Robert W. Hambrook of the U.S. Office of Education told a meeting of the Exchange Clubs that model aviation is an activity of paramount importance to the nation's war effort.

He said that the British began some time ago to train youths of 16 to 18 years of age in the fundamentals of aviation, ground work and basic procedure. From his personal observation during a visit to England, Dr. Hambrook reported that the plan was highly successful. He explained that the building and flying of model planes gave young men a splendid background for later military service.

Dr. Hambrook predicted that with the growing interest in model aviation and the development of aviation education in the public schools, a vital contribution will be made to the war effort.

Toledo model builders, representatives of the public schools, and other groups attended the meeting.

Dr. Hambrook received an honorary membership in the Auburndale Exchange Club from E. W. Poague, and an honorary commission as an educational officer in the Exchange Sponsored Civil Air Service Squadron from Art Rice, Chairman of the A.M.A.'s Press Section and director of education for the National Exchange.

Sanctioned Contests

(The address of the Contest Director is listed with the earliest contest under his direction)

August 2, 1942—Seattle, Wash. Class AA Outdoor Rubber Powered and Glider Meet at Kent Model Airport; $25 in merchandise awards; CD Roger W. Brengman, 124 24th Avenue, Seattle, Wash.

August 2, 1942—Hampton, Va. Class A Gas Model Meet for Members of Hampton Roads M.A.A. CD Jimmy G. Metchicas, 245 Chapel St., Hampton, Va.

August 9, 1942—Columbus, Ohio. Curtiss-Wright Contest held at Clickengers Field, Columbus, Ohio; Prizes—trophies, war stamps, merchandise—Total value, $300.

August 9, 1942—Hampton, Va. Class A Indoor Model Meet for Members of Hampton Rds., M.A.A. CD Jimmy Metchicas.

August 9, 1942—Steubenville, Ohio. Class AA Sky Hawks Meet; Gas A & B Combined; Class C; Rubber—Fuselage & Stick; Prizes—motors, kits & merchandise; 50 expected; CD Frank Barilla, 432 Maxwell Avenue, Steubenville, O.

August 15-16, 1942—St. Louis, Mo. Class AAA Tenth Annual Miss. Valley Model Airplane Meet; Indoor Events at St. Louis Arena & Outdoor at Parks Airport. CD Robert H. Sommers, c/o Stix, Baer & Fuller, St. Louis, Mo.

August 16, 1942—Denver, Colo. Record Trials of Exchange Gas Model Club of Denver at club flying field; Prizes—$10 cash; 25 expected; CD L. W. Fick, 1929 Broadway, Denver, Colo.

August 16, 1942—Hampton, Va. Class A Outdoor Rubber Model and Glider Meet; CD Jimmy G. Metchicas.

August 22, 1942—Boston, Mass. Summer Series of Junior Aviation League, Class A; Outdoor Events, all Classes Gas, Extra Events for Record Trials; 50-75 expected; CD Everett Tasker, 2 Pearl St., Charlestown, Mass.

Sept. 5, 1942—Boston, Mass. Summer Series of J.A.L., Class A; Outdoor Events, all Classes Gas; Extra Events for Record Trials; 50-75 expected; CD Everett Tasker.

Sept. 6, 1942—Seattle, Wash. Class AA Seattle Model Airplane Club Contest at Ft. Lewis Field; All classes of gas models; $25 in merchandise awards; 150 expected; CD Roger Brengman.

Sept. 6, 1942—Toledo, Ohio. Class AA Buckeye Fall Model Aviation Contest; Rubber and Gas Models; CD Arthur H. Rice, 2438 Auburn Avenue, Toledo, Ohio.

Sept. 6, 1942—Salt Lake City, Utah. Class AA Gas Model Meet at Saltair Beach for all classes of models; CD Jack Douglas, 105 East Second St. S., Salt Lake City, Utah.

Sept. 6, 1942—Hampton, Va. Class A Outdoor Meet for Members of Hampton Roads M.A.A. CD Jimmy G. Metchicas.

Sept. 13, 1942—Hampton, Va. Class A Indoor Meet for members of the Hampton Roads M.A.A. CD Jimmy G. Metchicas.

Sept. 20, 1942—Baltimore, Md. Class AAA 4th Annual Aerocraftsmen Invitation Meet at Model Haven for all classes of gas models; CD Robert W. Stevens, 2414 Kentucky Ave., Balto.

Sept. 20, 1942—Steubenville, Ohio. Class AAA 2nd Annual Ohio Valley & Tri-State Model Championships; Gas A & B Combined; Cass C; Rubber—fuselage & Stick; 50-100 expected; Trophies, motors & merchandise awards; CD Frank Barilla.

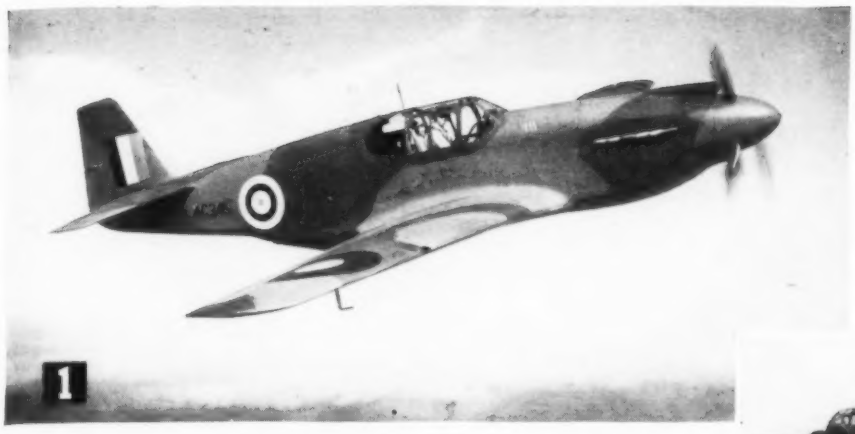
Sept 20, 1942—Holyoke, Mass. Class AA Holyoke G.M.C. Invitation Meet at Tobacco Fields Flying Site; All Classes of Gas; CD Robt. E. Ezold, 37 Lynwood Ave.,

(Continued on page 46)

MODEL AIRPLANE NEWS – MODEL GAS ENGINE DIRECTORY FOR 1942

NAME	CLASS	CYLINDERS	BORE	STROKE	CYCLE	PORTS	H. P.	BARE WT.	C. I. D.	PROPELLER DIA.	PROPELLER PITCH	FUEL RATIO	GRADE OF OIL	ENGINE MOUNT	GAS FEED	K=KIT FORM A=ASSEMBLED	PRICE	MINIMUM WT. OF PLANE IN OZ.
ATOM	A	1	0.500	0.500	2	ROTARY	1/10	2	0.098	8-9	5-7	2.5-1	70	BEAM	SUCTION ROTARY	A	15.50	7.76
CANNON "300"	B	1	0.750	0.678	2	FULL	1/5	6 1/2	0.300	14	8	4-1	70	BEAM	SUCTION	A	18.50	23.9
CANNON "358"	C	1	0.750	0.812	2	FULL	1/4	6 1/2	0.359	14	8	4-1	70	BEAM	SUCTION	A	19.75	28.6
CYCLONE "SINGLE"	C	1	0.937	0.937	2	2	1/5-1/4	7 1/2	0.647	13	6	3-1	70	BEAM	SUCTION ROTARY	A	13.00	51.8
CYCLONE "DUAL"	C	1	0.937	0.937	2	2	1/5-1/4	7 1/2	0.647	14	8	3-1	70	BEAM	SUCTION ROTARY	A	15.00	51.8
ELF "SINGLE"	A	1	0.468	0.564	2	3	1/12	3	0.097	8	5	3-1	40	BEAM	SUCTION	A	21.50	7.76
ELF "TWIN"	A	2	0.468	0.564	2	3	1/6	5	0.194	10	6	3-1	40	RADIAL	SUCTION	A	31.50	15.8
ELF "FOUR"	C	4	0.468	0.564	2	3	1/3	9	0.388	13	7.5	3-1	40	RADIAL	SUCTION	A	49.50	3.17
FORSTER "29"	B	1	0.750	0.672	2	ROTA VALVE	1/5	53/4	0.297	12	4	3-1	70	RADIAL BEAM	SUCTION	A	18.75	23.8
G H G	C	1	0.937	0.750	2	4	1/5	10	0.518	14	8	2-1	70	BEAM	SUCTION	K A	4.75 6.95	41.4
GWIN AERO	C	1	0.875	0.750	2	4	1/5	7 1/4	0.450	12	6	2-1	70	BEAM	SUCTION	A	15.00	36.00
MIGHTY MIDGET	C	1	0.875	0.750	2	4	1/5	7 1/4	0.450	12	6	2-1	70	BEAM	SUCTION	A	12.50	36.00
MARVIN	A	1	0.562	0.562	2	3	1/10	4 1/2	0.140	9	3	4-1	70	RADIAL BEAM	SUCTION	A	9.95	11.2
MEGOW	A	1	0.625	0.625	2	4	1/7	3	0.191	9	4	4-1	70	BEAM	SUCTION	A	12.50	15.9
OHLSSON "19"	A	1	0.687	0.531	2	3	1/7	4	0.197	9-10	5	3-1	70	BEAM RADIAL	SUCTION	A	16.00	15.9
OHLSSON "23"	B	1	0.625	0.687	2	3	1/6	4 1/2	0.211	10-11	6	3-1	70	BEAM RADIAL	SUCTION	A	18.00	1.84
OHLSSON "60" SPECIAL	C	1	0.3125	0.875	2	3	1/4	9	0.067	14-15	10	3-1	70	BEAM RADIAL	SUCTION	A	20.00	48.00
O K "49"	C	1	0.900	0.775	2	3	1/5	8	0.493	13-14	8	3.5-1	70	BEAM RADIAL	SUCTION	A	15.50	39.4
O K "SPECIAL"	C	1	0.900	0.950	2	3	1/4	7 1/4	0.605	14-15	8.5-10	3.5-1	70	BEAM RADIAL	SUCTION	A	15.50	48.3
O K "DE LUXE"	C	1	0.900	0.969	2	3	1/4	7 1/4	0.617	14-15	8.5-10	3.5-1	70	BEAM RADIAL	SUCTION	A	19.50	49.3
O K "TWIN"	C	2	0.900	0.950	2	3	1/2	22	1.210	18	12	4-1	70	RADIAL	GRAVITY	A	40.00	96.6
O K TORNADO (AIRCRAFT)	C	1	0.900	0.950	2	3	1/4	12	0.604	14-15	8.5-10	4-1	70	BEAM	ROTARY VALVE	A	22.00	48.3
PHANTOM P-30	B	1	0.713	0.750	2	3	1/5	6	0.299	12	9	2.5-1	70	BEAM	SUCTION	A	9.75	23.6
ROGERS RMC-2	B	1	0.812	0.562	2	2	1/6	4 3/4	0.291	10-11	6-7	11-5-1	70	BEAM	SUCTION	A	9.75	23.4
ROGERS "29"	B	1	0.812	0.562	2	2	1/6+	4 3/4	0.291	10-11	6-7	11-5-1	70	BEAM	ROTARY VALVE	A	14.00	23.4
ROGERS "35"	C	1	0.888	0.562	2	2	1/5	4 3/4	0.350	11-12-13	7-8-9	11-5-1	70	BEAM	ROTARY VALVE	A	14.50	28.00
SKY CHIEF	C	1	0.875	0.875	2	4	1/5	10	0.526	13-14	7-8	4-1	70	BEAM	SUCTION	A	7.95	42.1
TIGER AERO	C	1	0.875	0.750	2	4	1/4	7 1/2	0.450	12	6	2-1	70	BEAM	SUCTION	A	18.50	36.00
HURLEMAN	C	1	0.875	0.812	2	FULL	1/5	6 1/2	0.488	12-14	6-10	3-1	70	BEAM	SUCTION	A	16.50	39.24

ENGINES LISTED ABOVE WERE BEING MANUFACTURED AT DATE OF PUBLICATION – FLYING WEIGHT IS OMITTED DUE TO INTERCHANGEABILITY BETWEEN VARIOUS MAKES OF COILS, CONDENSERS, AND BATTERIES – ALL ENGINES BLOCK TESTED BEFORE SHIPMENT – PROPELLER SIZE GIVEN IS RECOMMENDED BY ENGINE MANUFACTURER – BARE WEIGHT DOES NOT INCLUDE COIL, CONDENSER, HIGH TENSION LEAD – ALL FIGURES SUPPLIED BY INDIVIDUAL ENGINE MANUFACTURERS – ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE – CUBIC INCH DISPLACEMENT IS DERIVE BY USING FORMULA: $B^2 \times S \times N \times (0.7854) =$ CUBIC INCH PISTON DISPLACEMENT – B=BORE – S=STROKE – N=NO. OF CYLRS.



FRONTIERS

The Vanguard of the New Air Age

1. North American Mustang, single seat fighter dressed in Royal Air Force camouflage. U.S. Army version is the P-51

2. Curtiss Wright Seagull SO3C-1, new Navy scout observation plane with long cruising range. Note upturned wing tips

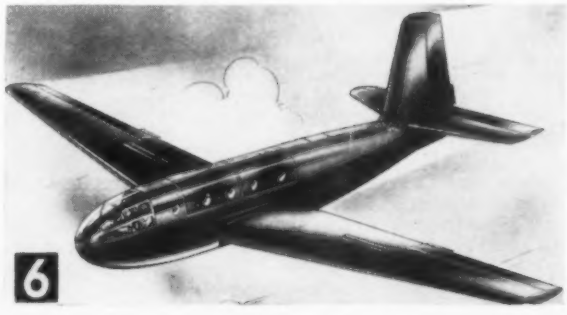
3. The Army's new ambulance plane, Stinson O-49B, with slots and flaps (Peter Bowers photo)

4. This shows the huge size of the Handley Page Halifax bomber used on expeditions over Germany (Brit. Comb.)

5. A Bristol Beaufort releases a torpedo. It has proved to be an excellent torpedo plane (Brit. Comb.)

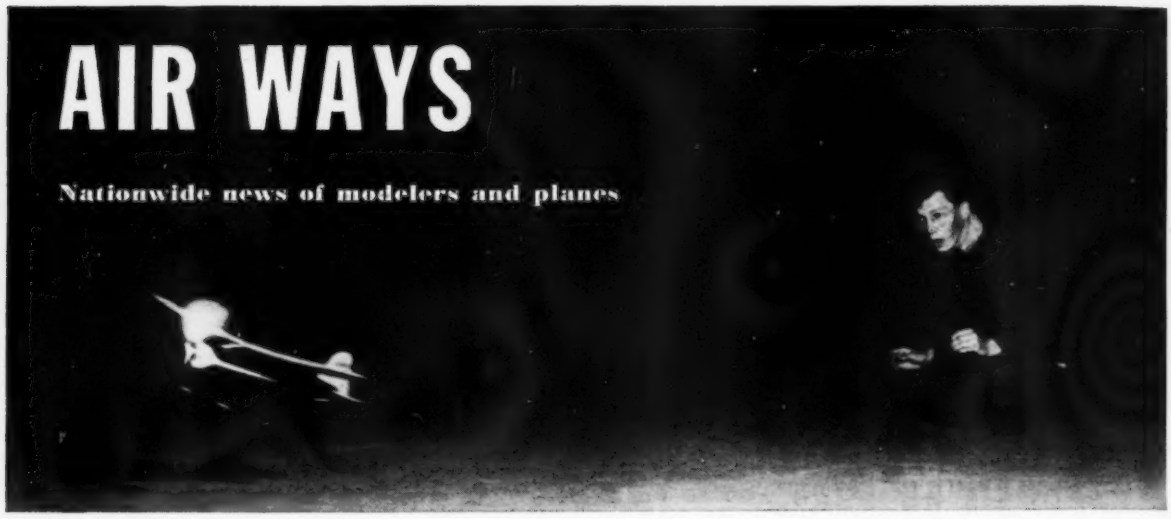
6. New 12 place amphibian glider order for the U.S. Navy—as large as a Douglas airliner (Acme)

7. Boeing AT-15 crew trainer, the first standard trainer designed and equipped for integrated tactical training of pilots, bombardiers, navigators, etc.



AIR WAYS

Nationwide news of modelers and planes



The 13th annual New England Championships

THE war has brought about two significant changes in model aviation. The first is in design.

Scarcities of model building material—like rubber, balsa and metal for engine manufacture—forces the aeromodeler primarily to the use of hardwood in model structures, and a change from powered planes to gliders. Sources of rubber have not as yet been entirely shut off, though gradually reduced; so we may expect that some rubber powered planes will be built, but in a decreasing number as the months go by. The same may be said for gas jobs; though the flying of these ships may not be affected immediately, because engines usually last longer than rubber.

Many with foresight are turning to the design and construction of gliders. These may lack the thrill of power driven craft but much can be learned from flying this type of model.

It may be interesting to speculate on the trend. The essence of the problem of glider performance is aerodynamic efficiency plus proper flying technique. Consequently, modelers are going to turn their attention to improving the design of ships and to increasing lift-drag ratios; producing more efficient wings, and more efficient arrangement of wings, tail and auxiliary structure.

We expect to see planes with higher aspect ratio, carefully laid out wing sections, and plan forms which reduce drag and increase efficiency. Some modelers unquestionably will design gliders also with an eye to powering them with rubber or gas engines—in the event that these two means of power can be occasionally gleaned from the decreasing supply.

Because of this we may expect to see a change in gas models: from the overpowered, fast-climbing type to those favoring climb by added efficiency and wing area. In other words, the future models will fly more like airplanes than like helicopters.

We believe this to be a healthy trend, one that will turn the considerations of model builders into the channels of thought followed by large plane designers. The main objective is to obtain greatest flight efficiency for available power, not to obtain performance dependent entirely upon power regardless of airplane efficiency.

Picture 11 shows John Januska of North Adams launching his Sinbad glider. He is one who has taken the motor shortage seriously and has ventured into this comparatively new field of glider design. The picture was taken at the recent New England Championships sponsored by the Jordan Marsh-Boston Traveler Junior Aviation League of Boston, Mass. This contest is held annually and is one of the oldest regular contests, if not the oldest, dating as far back as 1927.

This brings up the second change in procedure due to the war. Everyone knows by now that the Nationals has been cancelled for "the duration." Consequently, sectional meets are being held all over the country.

The 13th annual New England Championships, which took place on June 6th and 7th, was one of 1942's first sectional meets. More than 200 entrants flew 500 ships during the two days of the contest.

3. Henry Fettig's winning scale Rearwin Speedster takes off

4. Stan Colson and fuselage model that placed second. Colson also won first in the Indoor Scale event

(Below) 1. Speakers at guest table with "indoor" trophies on display (Right) 2. Young airmen "weigh in" at the New England Championship Indoor Meet

5. Everett Tasker with his "Boner" Trophy is doubtful about the compliment (Below) 6. First place indoor winners: L. to R. Harry Lerman, Stick and Flying Scale; G. Dupero, Beauty; Henry Fettig, Guillow Scale

7. National champ Gordon Cain launches his indoor cabin model for a long flight

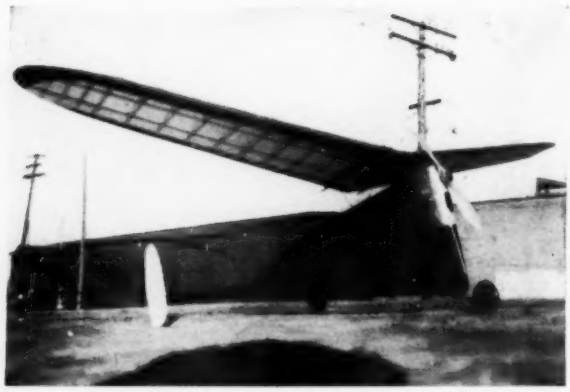
14. George Dupero with his model that won the Beauty contest at the spirited New England meet

8. A 12" U-control gas job and its builder-pilot Bob Sowden (Below) 9. Versatile Paul MacCready, Jr., with his helicopter that flew out of sight

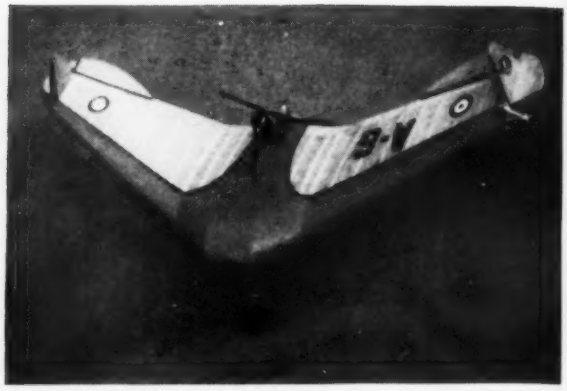
10. MacCready with his flying scale Skyfarer, sporting a folding prop (Below) 11. John Januska test glides his Sinbad glider at the Boston meet

15. Ed Rosen launches his stick model that took 2d place (Below) 16. MacCready pulls still another "out of the hat"—an ornithopter . . . and it flew

(Left) 12. Sid Battersby launches his gas job that placed in Class B (Right) 13. MacCready with another creation: a combination autogiro and airplane



17. A unique but fine flying gas model by Ralph Ullenberg and Edward Pietrzak



20. Fred Beddiges' semi-scale Northrup Manta gas model is a fine flier

18. A fine detail scale model Spad cleverly posed by its builder, Jack Hollander

19. Three views of Ed Soltis' gas job, built with folding wings to facilitate transportation

Probably the greatest reason for the turnout was the addition of gas models to the list of events; something which the League had been agitating for years but which was put through only a few months ago. This was due chiefly to the fact that the State of Massachusetts had discouraged gas model flying.

The indoor events were held at the Boston Garden on Saturday, June 6th, running from 9 a.m. to 4 p.m. Though attendance was no greater than in other years, the contest seemed more spirited.

In the Gas Beauty event George Dupero of Hyde Park repeated his win of last year, with the same ship—a modified New Ruler. He is shown in picture 14 with two other contestants of the fair sex. The ship was a beautiful job and had a mirror-like finish, due to several additional coats of dope applied since last year.

Picture 2 shows a lineup of the contestants for the Guillow Indoor Scale Model event which created considerable interest. It was won by Henry Fetting of Roxbury, shown in picture 3 starting his Rearwin Speedster on the winning flight. Other winners were:

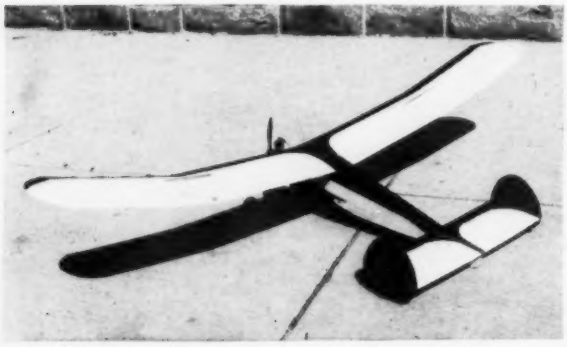
The Stick Hand Launched event, Harry Lerman of Malden with a 16:33.0 flight; Fuselage Rise-Off-Ground, Edward Domohowski of Boston with 8:56.4; Stick ROG, Ralph Brown of Arlington with 12:59.4; Flying Scale, Harry Lerman with 59.6 sec. Stanley Colson of Everett won the Flying Scale event on the basis of points, scoring 973. The Joe Toye Beginner's Trophy was won by Robert Wykes of Medford; he was judged the outstanding "beginner" modeler. The Willis Brown Trophy was won for the second successive year by Gordon Cain of Hyde Park (Stick H. L. Open). He is shown in picture 7 launching his beautifully built fuselage job.

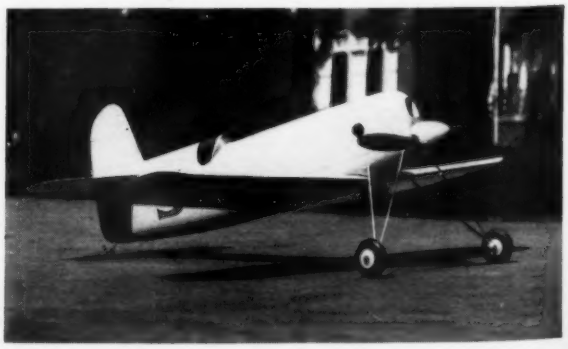
The outdoor flying followed on June 7th at the Framingham Airport where there is plenty of room for gas models. Events were run from noon to 6 p.m., the morning weather being unsettled. Contestants and spectators were directed along the road to the airport from Boston by arrow signs; incidentally, out of the twelve signs put up only one was recovered on the way home, the rest were taken by souvenir hunters. Actual flying started at 12 and was interrupted for an hour at 2:30 to let a thunderstorm and plenty of rain go by, turn around and come back again. Flying was resumed at 3:30 until 6, after which there was a short wait until contest results could be determined and the prizes awarded to winners.

One of the most unique features of the outdoor contest was put on by Paul MacCready, Jr. This young man is by far the most versatile model flier ever to come to our attention. Apparently he doesn't go out with the sole objective of winning prizes, but he is also interested in models for the purpose of experiment and developing new ideas. Construction is secondary as long as he can demonstrate a new principle, or an efficient way to handle an old one.

Picture 10 shows him with his flying

21. Richard Haysen's large "tether" plane has consistently turned in flights of 64 mph with a 52 ft. line





22. A Waco cabin plane comes in for a landing—no fooling, it's Ken Willard's gas model

24. Ken Willard with his beautiful model Waco. Why build contest planes when you can make them look like this?

scale Skyfarer which flew very well though it did not place among the winners.

Now we come to a demonstration of Mr. MacCready's versatility: In picture 9 you see him with a helicopter which he demonstrated, and, incidentally, bettered the results of fuselage and stick models—on the last flight it flew completely out of sight.

But that isn't all; in picture 13 MacCready has his combination autogiro and tandem plane. Though the rotor, because of its small size, did little to contribute to the flight, it operated successfully and functioned to give a percentage of lift. The ship is exceedingly unique. Note that vertical wing tip fins are used; they are not merely ornaments, but prevent the rear of the tail from slipping sideways and they give a correct position to the vertical side area.

But MacCready is still going strong, for he pulled out of his box an ornithopter with which he is shown in picture 16. The design shows great originality and, what is more, it operated successfully.

Apparently Mr. MacCready builds primarily to demonstrate ideas, for he won no trophy nor was there an event for originality and new design—which is to be regretted. Because of his scientific contributions, however, MODEL AIRPLANE NEWS considers him one of the outstanding modelers at the contest.

The Stick Hand Launched event was won by Jack Block of Hartford, Conn., with 4:03.0; Ed Rosen of Hartford was second with 3:32.2.

Picture 15 shows Rosen ready to launch his stick job. He uses a single blade propeller which was very efficient, giving the plane a high angle of climb.

Eugene Engelhardt of Cranston, R.I., won the Fuselage ROG event with 3:01.0, and Stanley Colson of Everett was second with 2:34.0. Colson is shown in picture 4 holding his fuselage job.

The Outdoor Flying Scale was won by Harry Lerman with 110 points. Class A Gas was won by Frank Barmakian of Watertown with 192.6; Class B by Evo Castelli of Framingham with 254; Class C by Stanley Crawford of Framingham with 240. In the Open Class, Bernard Collins of Providence won the A event with 268, the highest A time at the meet and next to the highest in any gas event. Pretty good for an A model! Collins apparently was "out for blood" for he also won the Class B Open with 388, the highest time in the meet. Class C Open was won by Manuel Paiva of Cambridge with 272.

Picture 12 shows Sid Battersby of Revere who won 3rd place in Class C Open. Here you see him in a dramatic moment, launching his job.

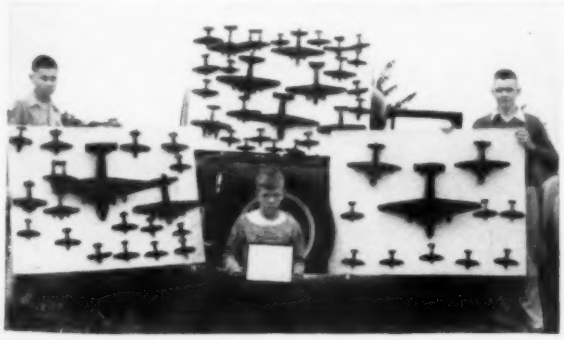
A unique demonstration was put on by Bob Sowden when he flew his 12" wingspan U-control biplane, powered with a Husky engine, shown in picture 8. Just a few years ago they would have called such a plane an "impossible freak." It takes a delicate touch to fly such a model; its speed is well up around 60 mph.

The big moment for winners came at the Victory Banquet, held in the Grill

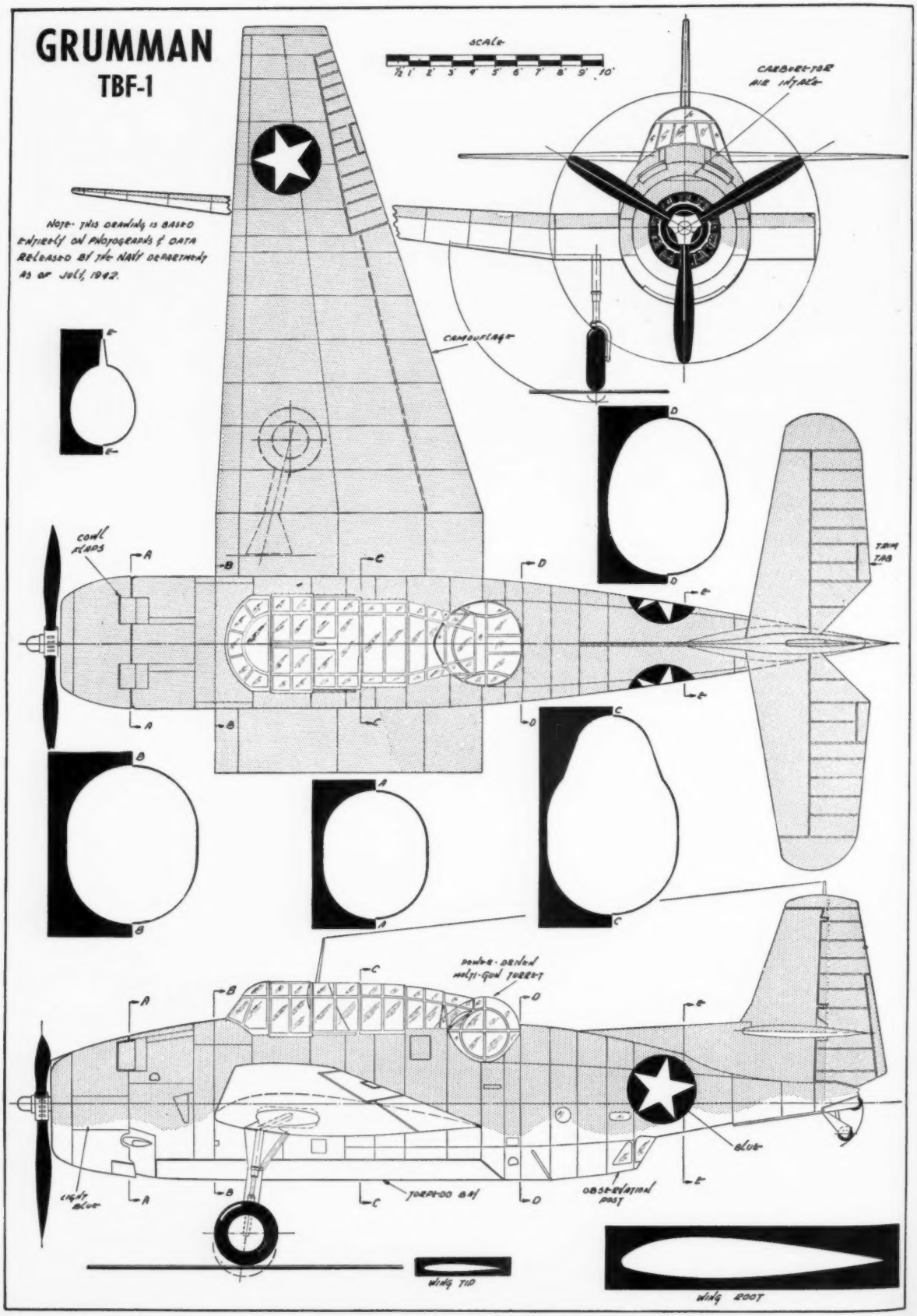
(Continued on page 35)

25. John Bock launches his world record autogiro. (Below) 26. Chief Pilot for United Air Lines, Walt P. Adams, finds time to build and fly models

23. Models constructed for the Navy by the St. Paul Modeleers



27. The Chicago Flying 8 Balls get together for a flying spree


GRUMMAN
TBF-1
SCALE
½' 1' 2' 3' 4' 5' 6' 7' 8' 9' 10'
NOTE: THIS DRAWING IS BASED ENTIRELY ON PHOTOGRAPHS & DATA RELEASED BY THE NAVY DEPARTMENT AS OF JULY, 1942.
CARBURETOR AIR INTAKE
CAMOUFLAGE
COWL FLAPS
TRIM TAB
POWER-DRIVEN MULTI-GUN TURRET
BLUE
LIGHT BLUE
TORPEDO BAY
OBSERVATION POST
WING TIP
WING ROOT

MIDWAY'S AVENGER

Grumman "Avenger" TBF-1, the most deadly torpedo-bomber in the world

The plane on the cover

OBVIOUSLY it is much too early to determine accurately if the recent battle at Midway Island in which an air force, unaided, defeated a sea force, has actually broken the backbone of Japanese naval power. Certainly the "Nips" lost a huge amount of fighting tonnage in that encounter which, coupled with other known losses, has made a gaping hole in the Japanese Navy.

That she had placed a primary importance upon her fleet of ten aircraft carriers as a basic unit in her task forces is logically assumed from a study of the tactical organization which attacked Midway Island. The force was discovered about 600 miles west of the U.S. Pacific stronghold, and this distance indicates the extreme range of the continuous offshore patrols of our Navy's PB's. It consisted, actually, of a main force and a reserve group. In the former were four carriers, three battleships and a supporting group of cruisers and destroyers. According to official Navy reports this attacking force had assumed the following tactical formation: four aircraft carriers, in-line, protected on either beam by heavy cruisers and by a large force of swift destroyers continually changing bearing so as to cut back and forth in an effort to scare off lurking submarines. The three battleships followed this battle line at a distance of some 50 miles, and they too were in-line protected by cruisers and destroyers. This was the standard task force battle-line with one important and comparatively radical change: the carriers were in the vanguard rather than trailing behind the fire-power of the battleships.

Thus the pattern indicated that the initial phase would comprise a devastating air attack upon the island by bombers protected by fast-climbing fighting planes followed by the heavy guns of the battleships after the defenses of the island had been reduced.

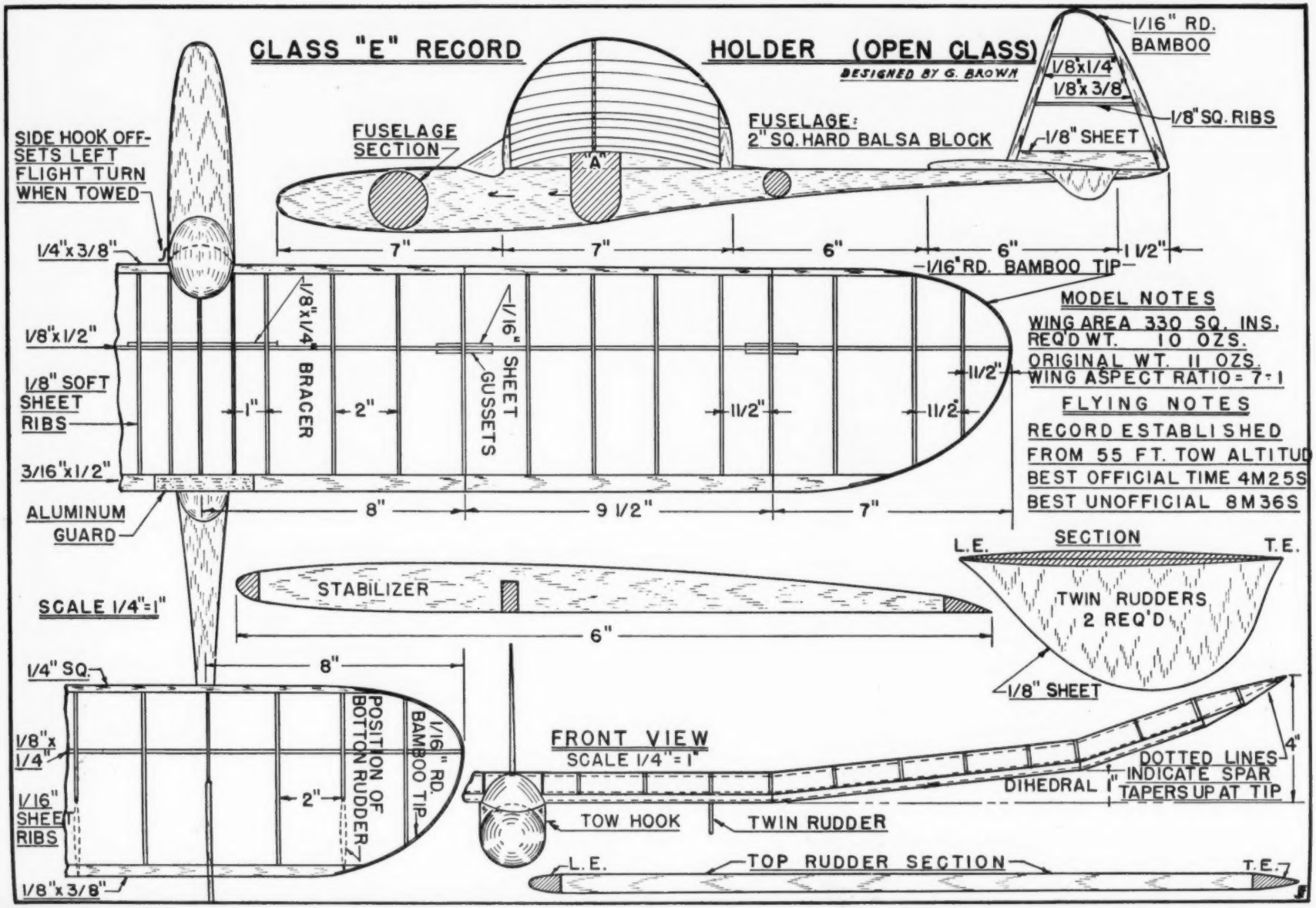
In the supporting force were another carrier, several cruisers and destroyers and a number of laden troop transports which would have been landed and the island captured after the smashing gun fire of the battleships had eliminated organized resistance.

Certainly the plan was well plotted, the strength and power of the fleet was considerable and, under favorable circumstances, the attack would most certainly have been made good. The Navy has said nothing of the defending sea forces of the island, although an aircraft carrier has been mentioned. Therefore, assuming that the sea-borne defending power was slight, the chances of Japanese success, based on strength, plan and defences of the objective, were excellent. But one small Dutch Boy jammed his finger in the dyke: American Naval Air Power! And the heart of this power was a secret war weapon about which both the enemy and our own home forces (U.S. citizens at large) knew nothing: the Grumman "Avenger" TBF-1 torpedo-bomber.

The Japanese attackers were spotted in late afternoon, and darkness overtook the action before extensive tactics could be recorded. Three Flying Fortresses, under command of Lt. Col. Walter C. Sweeney Jr., attacked the fleet before dusk and reported that a cruiser and a transport had been hit. The next morning Sweeney's men returned to the scene only to miss the main fleet, discovered by Midway's patrol planes just 125 miles west of the island. Then the mid-Pacific rocked with the thunder of screaming motors of exploding bombs, with cannon fire and ma-

(Continued on page 40)

Power turrets and belly guns bring destruction to attackers


CLASS "E" RECORD HOLDER (OPEN CLASS)
DESIGNED BY G. BROWN
FUSELAGE SECTION
FUSELAGE: 2" SQ. HARD BALSA BLOCK
"A"
1/16" RD. BAMBOO
1/8"x1/4"
1/8"x3/8"
1/8" SQ. RIBS
1/8" SHEET
SIDE HOOK OFF-SETS LEFT FLIGHT TURN WHEN TOWED
1/4"x3/8"
7"
7"
6"
6"
1 1/2"
1/16" RD. BAMBOO TIP
1/8"x1/2"
1/8" SOFT SHEET RIBS
3/16"x1/2"
1/8"x1/4" BRACER
1/16" SHEET GUSSETS
1"
2"
1 1/2"
1 1/2"
1 1/2"
ALUMINUM GUARD
8"
9 1/2"
7"
MODEL NOTES
WING AREA 330 SQ. INS.
REQ'D WT. 10 OZS.
ORIGINAL WT. 11 OZS.
WING ASPECT RATIO = 7:1
FLYING NOTES
RECORD ESTABLISHED FROM 55 FT. TOW ALTITUD
BEST OFFICIAL TIME 4M25S
BEST UNOFFICIAL 8M36S
L.E. SECTION T.E.
TWIN RUDDERS 2 REQ'D
1/8" SHEET
STABILIZER
6"
SCALE 1/4"=1"
1/4" SQ.
8"
1/8"x 1/4"
1/16" SHEET RIBS
2"
POSITION OF BOTTON RUDDER
1/16" RD. BAMBOO TIP
1/8"x3/8"
FRONT VIEW
SCALE 1/4"=1"
DOTTED LINES INDICATE SPAR TAPERS UP AT TIP
4"
DIHEDRAL 1"
TOW HOOK
TWIN RUDDER
L.E.
TOP RUDDER SECTION
T.E.

FLY THE "MISSING" LINK

A simply constructed class E towline soaring model that makes high performance possible for the beginner

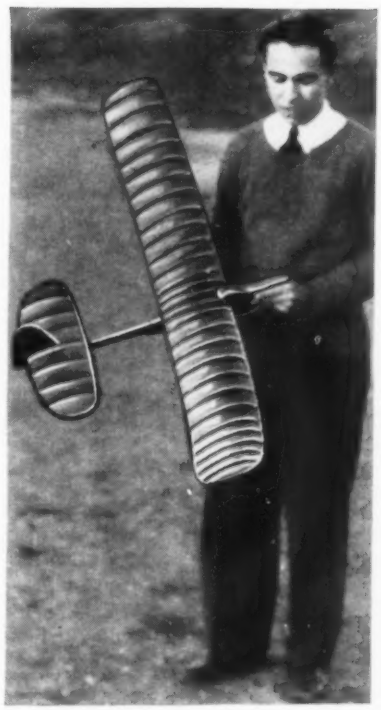
by **GEORGE BROWN**

THIS record soarer is the seemingly forgotten link between gas and rubber powered flight. In gas model flying a motor run is an assumed twenty seconds but the model may glide for many minutes. The same holds true for rubber powered models. Thus, disregarding the mode of power, model builders experience the same thrills when their models are soaring high overhead.

The "Link" is a model that compares in wing area to a small gas model, and since it is motorless, rubber builders can also fly it.

Only recently have these large soarers gained some of their justly deserved popularity. The thrill of seeing a tow launch glider soar slowly and lazily overhead, majestically rising along thermal paths, gives anyone the urge to build and fly his own model. As to competitions, model soaring glider Elmira meets "packs them in," so, why not start the ball rolling in your own club?

A word as to the design of the Link. As mentioned on the plan, the glider possesses a short moment arm and a rather low aspect ratio wing for a soaring glider. In experimenting with this design, the author has found that this glider could be made to circle tightly without spinning. The merits of this type glide in riding air currents is acknowledged by all. It is suggested that you first read through all the construction details before beginning the actual construction of this simple but high performance glider.



The author with his model before the record flight

WING—Although the wing has five sections, it is constructed as three: the center section and the two outer panels. The outer panels are later cracked to form the tip sections. Twenty-five ribs of 1/8" soft sheet stock are required. Shape the leading, trailing and center spars from hard balsa. Since the wing is of simple monospar construction, only the outer panels need be described.

First cement all but the tip ribs at their leading, trailing and center spar positions. Next taper the required amount from the spar as shown on the plans, for the tip taper. Then cement the bamboo tip to the leading and trailing edge spars. When dry, force it upwards and cement to the spar. This will give it an upward dihedral angle. The tip rib is cut to size from 1/8" sheet, as are all others. Next shape it to conform to the tip taper and cement in place. This completes the construction of one outer panel. Simply duplicate the procedure for the other.

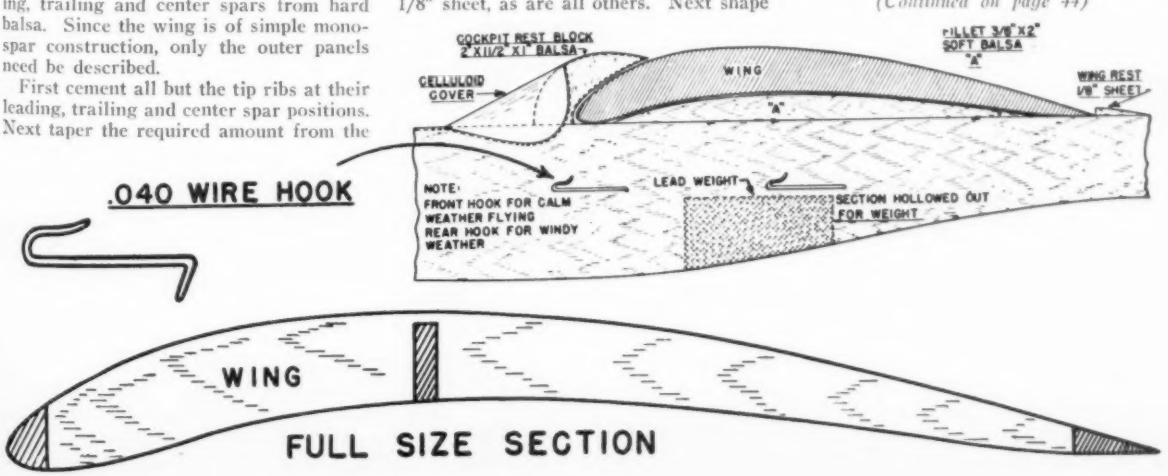
After having cut the required spar slant for the dihedral angle, pin and cement the three panels together. The dihedral angle should be one inch at the position shown on the plan. After the cement has dried, crack the spars of the outer panels at the required position, to form the fourth and fifth sections of the wing. These are then pinned and cemented together with the required four inches of dihedral.

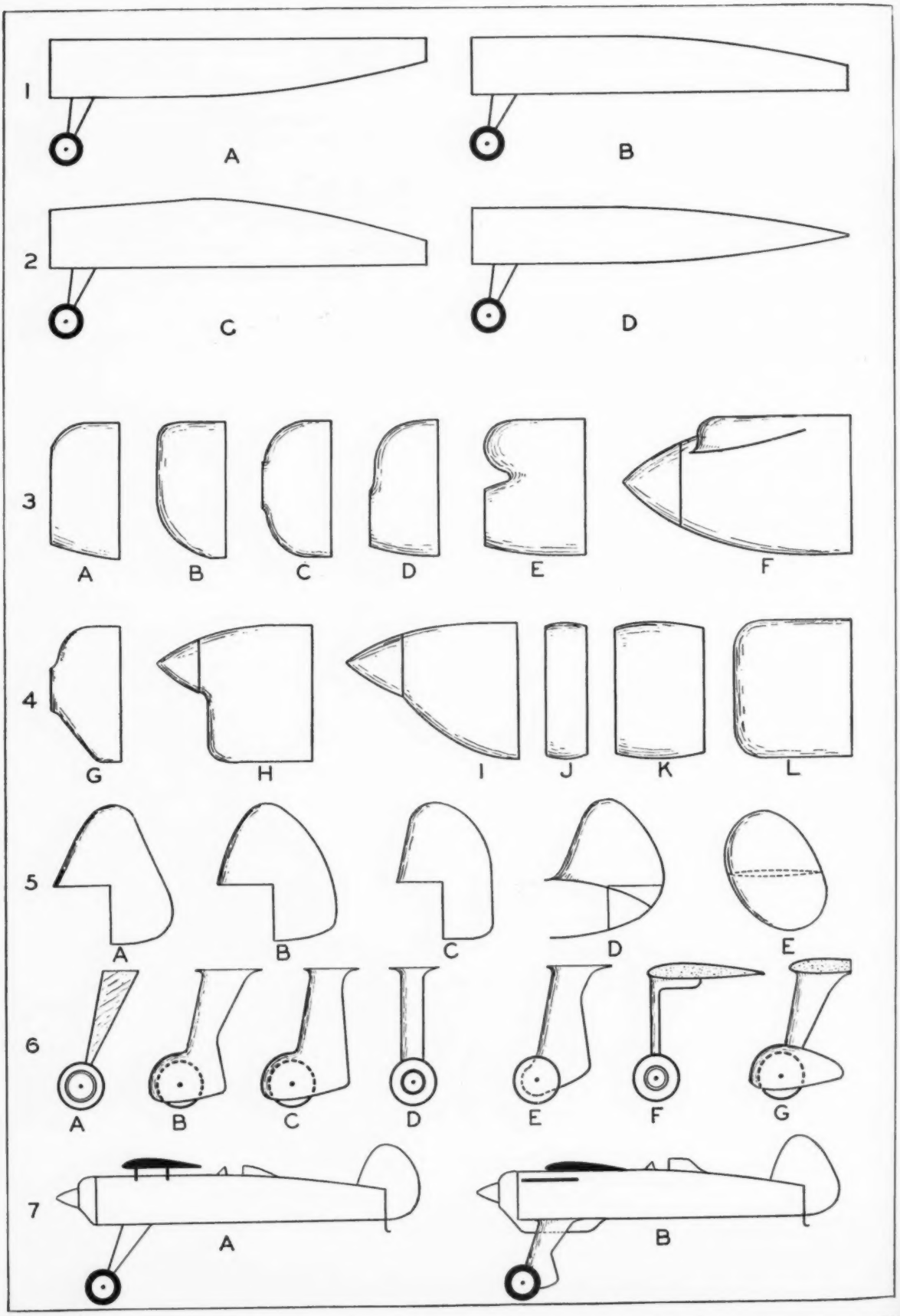
All joints are strengthened by 1/16" sheet gussets and extra coatings of cement. The center section is strengthened with a 1/8" x 1/4" hard balsa strip bracer. Notch the center ribs and cement in place. Next an aluminum sheet guard is cemented around the trailing edge where the wing meets the fuselage. This completes the construction of the wing framework.

Sand the complete framework with a fine sandpaper. Next cover the wing with a light bamboo paper. Each section must be covered individually, top and bottom, in order to obtain a good covering job. Make sure the paper sticks to the undercamber of each rib. After covering, water spray the paper and leave to dry. When dry, give the complete wing three coats of a clear dope. A light sanding will eliminate any rough paper spots.

FUSELAGE—Select a hard balsa block for the fuselage as this part of the glider will have to "take it" most. Next cut out the top and side views without rounding off any edges. Only after the fillet and wing rest blocks have been cemented in place do you start shaping the block with its required sections. Leave the fuselage

(Continued on page 44)

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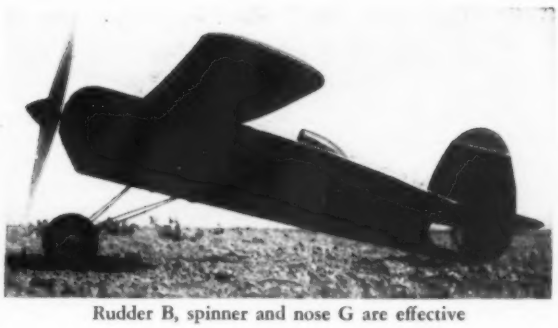
Fuselage downsweep and head-rest give "racy" effect



Rudder B, spinner and nose G are effective

DESIGNING FOR SNAP *by* ROBERT C. HARE

How to give your dream ship that racy appearance typifying speed and power

MODERN aircraft, insofar as design is concerned, have become excellent examples of the Form Follows Function theory of design. Known among industrial designers and architects as "F. F. F.," this theory simply means that a certain product is designed to best do its job, no matter what outward appearance it takes when completed.

Best modern example of F. F. F. in aircraft is the Gwinn Aircar. This airplane is certainly not a beautiful machine, because its final *form* evolved from the theories of its inventor; theories so arranged as to give the desired *function*. Evidence of F. F. F. can be found in almost every airplane built today, regardless of type.

Contrast this method of aircraft design with that in use twenty, or even ten years ago. Designers in those days compromised between what they thought looked like the airplane type they intended to produce and sufficient aerodynamic characteristics that gave them the performance they wanted. Take for example the Curtiss Falcon. Originally designed for observation, it was later rigged up as an attack plane. This old time method of shifting type was prevalent in the early days of bombing planes. "Build a plane that will carry a heavy load and the Army will have a bomber," was the manufacturers' cry.

But today an attack plane is designed solely for that purpose, a bomber designed to carry bombs, and interceptor to get after enemy machines. The conventional or even "good looking" plane is often lost in the search for efficiency; as in the Douglas B-18 bomber, or the Lockheed XP-48.

In much the same manner model builders of a decade ago designed primarily for sake of appearance and applied aerodynamic principles to their creations. This produced a series of designs which old-time builders will remember as "snappy looking" or "ready to jump" in their final form.

During the ensuing years as model builders followed the general trend of full size design, and the science of aerodynamics was earnestly applied, such unnecessary characteristics as those quoted above were lost by the wayside. Consequently a lot of the romantic idealogy of the model builder who today tries to design a "snappy looking product" has been dampened in keeping up with modern trends.

Efficiency, being the keynote, has left only the barest necessities for flight, exemplified by the creations of Goldberg, Zaic, Cahill and Grant, among some of the nation's leading model designers. They design for performance by scientific means (a good practice for all of us to follow) and they get contest winners.

Many of us who design and build for pleasure as well as performance unconsciously fall back to methods used years ago in which we first plan the machine as we want it, then apply enough aerodynamics to suit our immediate needs. We don't get prize winning performance, but we do get a "dream ship" that both flies and looks well. This method has in recent years found favor in England where machines so designed and built have been classified as "Semi-Scale."

Nose block D, large wheels, rudder C and spinner give speedy lines

Production of a Semi-Scale begins with a series of sketches in which the designer attempts to concentrate all the features that will enable him to produce the model he has in mind. He may attempt to create a pursuit ship, an attack or observation type. The primary requisite of such an undertaking, for instance in a pursuit type, would be to make a snappy looking model with an "up-and-at-'em" air.

An example of this procedure is shown at the top of the plate drawings printed here. These fuselage sketches on lines 1 and 2 illustrate the simplest method of designing "snap" into any type model. Note that in sketch A the fuselage is shown with a flat top and an upswing in the lower longerons toward the stern. This outline does not indicate the snap we want and is a very common profile. But notice that sketch B, which is virtually an inversion of A, impresses one as being ready to jump. This impression is obtained by use of a flat lower surface, bringing the upper longerons down toward the tail.

By dropping the upper longerons in this manner most model landing gears can be made to appear shorter; the average model undercarriage is badly out of scale when compared to a full size landing gear.

In sketch C the advantages of B have been increased by inclining the upper longerons from the nose to the middle of the body, as well as dropping them toward the rear. Flat lower longerons are retained and the "jumping impression" is thereby increased. By curving both upper and lower longerons toward the centerline point at the stern, the result shown in sketch D is in reality a combination of A and B. This profile is admirably suited to monocoque construction. The

(Continued on page 62)

Flat fuselage top and upsweep on bottom, together with small wheels, appear cumbersome

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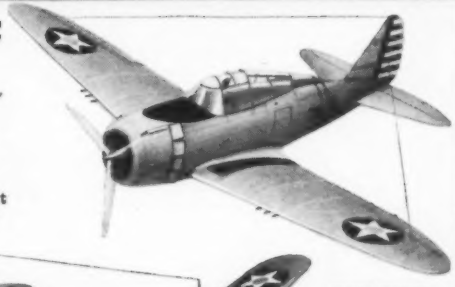

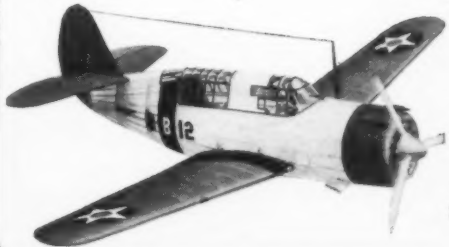

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SKY SCOUTS

Learn to spot enemy planes and help defend America

LESSON 8

THE number of Sky Scouts throughout the country has not only increased in the last month but the interest of those already enrolled is mounting. We have heard from a number of individuals and groups who are making use of every moment to learn distinguishing marks of enemy aircraft so they can serve as spotters to detect and report enemy planes.

The unit to have the honor of being listed as Unit 1 is located in Omaha, Nebraska. Its president is John Conkling of 516 N. 32 Street, who helped to organize the unit with Jack Ryan of 2726 Burt St. The club has been organized so there is a president, who also acts as secretary; and vice president who combines his duties with that of sergeant-at-arms. Mr. Conkling writes:

"We would greatly appreciate it if you would send us any form of educational material for use in training club members."

Several suggestions are made further on in this article.

We hear from Sky Scout John M. Bissell of Las Cruces, Box 312, N.M.:

"I will gladly form a unit as requested and get more Sky Scouts in my community; there are a lot of little towns right around Las Cruces in which I have

(Continued on page 47)

Can you identify this famous plane?
(See page 50)

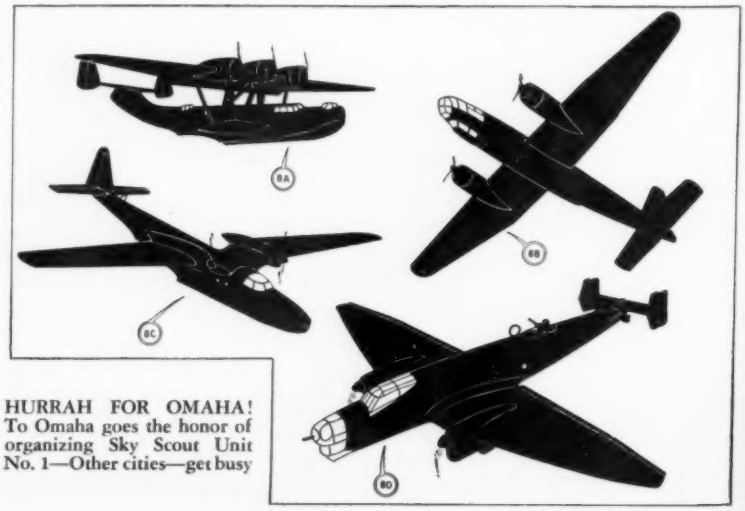
Description of Silhouettes Below

PLANE 8A—Dornier Do 24, three engine German patrol boat. Powered by air cooled engines it is one of the easiest Dornier boats to "spot." Its extremely high wing, thick sponsons and twin tail aid in its identification. The craft mounts three movable machine gun turrets with a possible total of six guns.

PLANE 8B—Heinkel He 177, Germany's latest heavy bomber, was test flown two years ago and kept on the secret list until recently when the "bugs" were completely ironed out. Then it began rolling out of German factories in great numbers. The unique feature of this craft is that it is a four engine airplane although its external lines indicate it as a twin motor job. Its four 1,150 hp Mercedes Benz DB .601 engines are coupled into twin power units housed in but a single cowling and nacelle in each wing panel. Each unit drives a single four bladed propeller. Engines are set up side by side and in this form assume the designation DB .606. Units are liquid cooled but employ nose radiators which create the impression that they are air cooled. It mounts 2 cannons, one in the nose the other in the tail in addition to many defensively located machine guns. Dimensions are: span, 103 ft. 4 ins.; length, 67 ft. 3 ins.; height, 18 ft. 2 in.; wing area, 1,660 sq. ft. Weights: empty, 35,000 lbs.; loaded, 71,600 lbs.; max. overload, 82,000 lbs. Performance: max. speed, 280 mph at 19,000 ft.; max. range, 7,040 miles; service ceiling, 25,000 feet.

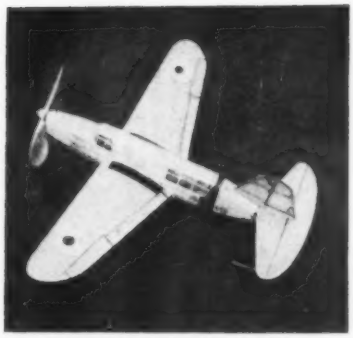
PLANE 8C—Dornier Do 26K, one of the latest long range flying boats produced by Dornier. It is powered with four 600 hp. Junkers Jumo 205C Diesel motors, has a top speed of 208 mph, and is capable of carrying 1000 lbs. of bombs, a 23 mm. cannon in the nose and two blister turrets in the fuselage. Dimensions: span 98 ft. 6 in.; length, 80 ft. 6 in.; height, 22 ft. 6 in.; wing area, 1,290 sq. ft.

PLANE 8D—Junkers Ju 86K bomber, powered by two 880 hp. BMW 132 Dc engines. It mounts machine guns in three stations; in the nose, beneath the fuselage and aft of the wing. Dimensions: span, 73 ft. 10 in.; length, 58 ft. 8 in.; height, 15 ft. 8 in.; wing area, 882 sq. ft.; weight empty, 11,354 lbs.; loaded, 18,040 lbs.; max. speed, 242 mhp; range, 915 miles; service ceiling 25,280 feet.



HURRAH FOR OMAHA! To Omaha goes the honor of organizing Sky Scout Unit No. 1—Other cities—get busy

29. Jordan Marsh Company's identification model display attracts many spectators



28. Jack Hendrickson's neat flying scale SO3C-1

Air Ways

(Continued from page 25)

Room of the Jordan Marsh Co., where many trophies, cups and merchandise prizes were awarded. There was also a battery of speakers who very considerately confined themselves to matters of interest to modelers.

Picture 1 shows speakers at the guest table which contained the indoor trophies. They are, left to right: Mr. Emerson, Asst. Director of Manual Arts for the City of Boston; Lt. Commdr. Brewer of the U.S. Navy; R. H. Edwards of Jordan Marsh; and Gummer Munnick, Director of the Junior Aviation League and the meet.

Picture 6 shows first place winners of the indoor meet. Left to right, they are: Harry Lerman, Stick H.L. and Flying Scale; George Dupero, Beauty; and Henry Fettig, Guillow Scale.

The surprise award of the evening was the last—the Boner Trophy—given to the League member who pulled the biggest modeling boner during the past year. With fitting ceremony and worthy buildup it was presented to Mr. Everett Tasker, one of the club officials. Mr. Tasker appears in picture 5 with his beautiful "little" trophy: a silver cup, 2" tall, suitably engraved. Here is the boner pulled by Tasker: When he hurriedly left his home for a recent contest he grabbed up his Speed Graphic camera, bag of accessories and the wing of his Bantam-powered Skyrocket, leaving the fuselage sitting comfortably on the top of his workbench! Tasker says:

"Well, that is one time that a prize backfired, for I was the one who suggested giving such a prize!"

We also have some pictures of interesting planes coming from other parts of the country.

Ralph J. Ullenberg of Milwaukee, Wis., sends us picture 17, showing his 68" wingspan Class B gas job powered with a Forster 29. Mr. Ullenberg writes:

"The model is exceptionally stable, almost impossible to spiral dive. It was flown at a 90 degree bank without dire effects, sustaining lift by its expansive side area. Little sensitivity to change of rudder settings was revealed, due to the very low c.l.a. The model was built to the exact design specifications laid down in the design articles by Mr. Charles Grant in MODEL AIRPLANE NEWS. The area is 143 sq. in.; airfoil, Grant X8.

"Mr. Edward Pietrzak collaborated with me in the design. Construction is extremely simple. The motor is radially mounted to the firewall with the air intake tube projecting through the firewall into the fuselage. Naturally the tank and carburetor assembly were also inside the fuselage, attached to the intake tube. A small rectangular space on top of the fuselage, adjoining the firewall, was left uncovered and fitted with a balsa trap-door for refueling and adjusting the needle valve. Any gas spilled into the fuselage while fueling is disposed of through a drain at the bottom. This arrangement gives an exceptionally clean and streamlined job which showed up in the model's performance."

Mr. Ken Willard sends us picture 22 of a Waco Cabin plane coming in for a landing and . . . Well, well, here it is again—in picture 24—held by its builder. Just a model but who would have believed it? The ship displays excellent design and workmanship, usual Willard characteristics.

Picture 21 shows a tether model of snappy design, built by Richard Haysen of Chicago. It has a wingspan of 36", length of 33", weight of 3 lb. and wing loading of 26-1/2 oz. This is rather large for a tether flier, but powered by an .6 cubic inch motor it has been clocked on four laps at an average of 64 mph. with a 52 ft. tether line.

Haysen says that the wing employs a Davis airfoil section. We wonder where he got the data for this section for we understand no accurate data has been published on this airfoil, though some claim that the data can be obtained from the patents. This is to be doubted; probably the formula given out is camouflaged to a certain extent.

The fuselage is monocoque construction hollowed from a solid balsa block. Control surfaces are solid and the wings made of balsa sheet.

It is lots of fun to build experimental models—to tread the unbeaten path, so to speak. Fred Beddiges of Jersey City, N.J., is one who enjoys pioneering, and his latest work is shown in picture 20: a semi-scale flying wing built along the lines of the Northrop Manta. Wing flaps and rudders were added to the wing tips to increase stability. It is powered by a Super-Atom and features tricycle landing gear. At a recent meet of the Jersey Airwheels it turned in flights of 63 and 67 sec. on a 20 sec. motor run. We believe that even longer flights can be obtained from this ship.

Edward Soltis of Yonkers, N.Y., has developed a very efficient gadget: a wing of a large span folding at the quarter points. The tips fold down and up under the wing center. In a series of three photos on page 22, one shows the plane with the wings extended. The rubber tensioners, holding the wing in place, may be seen on the top centerline of the wing. In another photo Mr. Soltis is in the act of folding in the wings; and a third photo shows the ship with the wings completely folded. What a simple matter it should be to transport this little ship.

The trick photography artists are at it again! We must compliment Jack Hollander of Youngstown, Ohio, for sending a photo of his Spad in such a realistic position as shown in picture 18. It is built to a scale of 1/2" to the foot, having a

(Continued on page 54)

30. Models lined up in the Beauty event at the Fresno Championships

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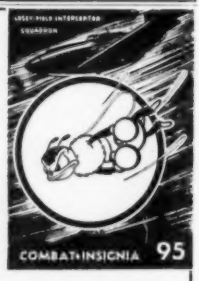

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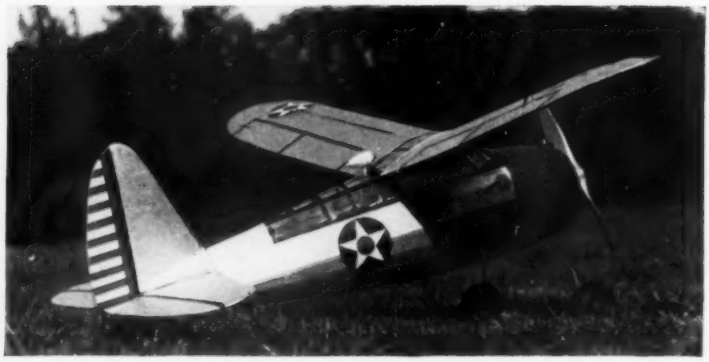

Just like the full scale plane when properly decorated

Plane is composed of separate units which are conveniently detachable, facilitating transportation

Gas Model Army Scout

(Continued from page 15)

by the designer, the editor of MODEL AIRPLANE NEWS, Mr. Charles H. Grant.

The model is large enough to take either a large Class A or B motor. The author used an Ohlsson 19 to power his O-52 and there was enough power to pull his model quite high on a twenty second motor run. Evidence of the flying ability of the model is that although it was always flown just before sundown when most of the thermals had died down, flights of several minutes were common and are now taken as customary.

The author has tried to adhere to true scale throughout and only very minor changes were made to insure stable flights. It is suggested that you fly without the single wing strut shown in the front view; the extra drag is not compensated by the appearance. If you wish to use the strut use dress snaps to keep it in place.

You will note that the plans are drawn to a very convenient scale of 1/3″ to the inch. Therefore all you have to do to obtain full size drawings is to enlarge the magazine plans three times. To make your task still easier we have supplied full size drawings of the fuselage bulkheads, wing ribs, tips and other important parts.

Well, that's enough talk about the Curtiss O-52. Now how about buckling down and see just how fine a job *you* can make of it? FUSELAGE—The fuselage is constructed with the use of a main crutch and a sub-crutch. The main crutch is shown in the fuselage top view. This is made from 1/4″ sq. strips of balsa. Note that the hardwood motor mounts are attached to the main crutch. Fill in around the motor mounts with 1/4″ soft sheet balsa. While cement is drying on the main crutch make the sub-crutch. This is made from 1/8″ x 1/4″ strips and cemented firmly together. Cut the piece S-C from 1/4″ sheet and cement to the front of the sub-crutch.

Now connect sub-crutch to main crutch as shown in the fuselage sketches with 1/8″ x 1/4″ uprights. Be sure to keep dimensions correct as given in the side view.

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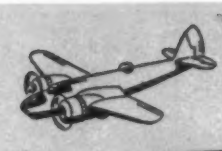

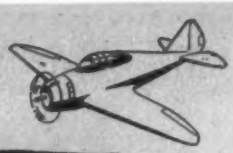

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A large part of the Megow plant is now engaged in war production for the Navy, and although "Every Day is Navy Day at Megow's", the production of regular lines is continuing. If an occasional delay occurs, we feel sure our dealers and customers will understand that the Navy must always *be first.*

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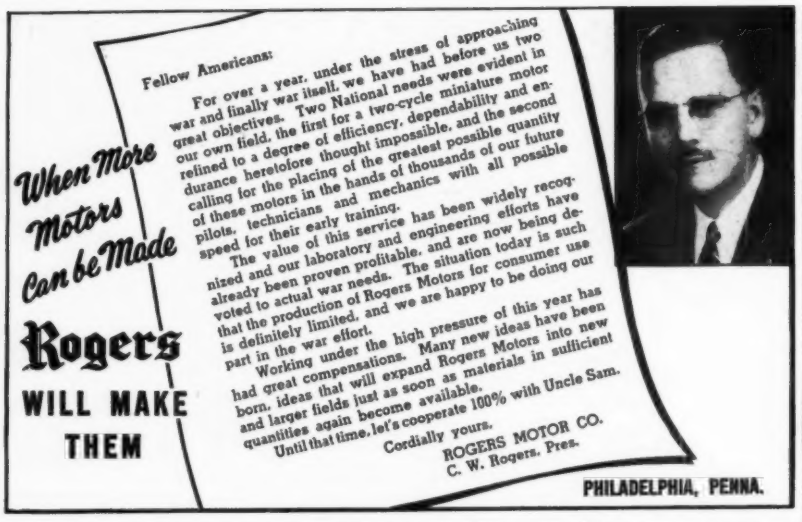
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WILL MAKE THEM
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For over a year, under the stress of approaching war and finally war itself, we have had before us two great objectives. Two National needs were evident in our own field, the first for a two-cycle miniature motor refined to a degree of efficiency, dependability and endurance heretofore thought impossible, and the second calling for the placing of the greatest possible quantity of these motors in the hands of thousands of our future pilots, technicians and mechanics with all possible speed for their early training.
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Working under the high pressure of this year has had great compensations. Many new ideas have been born, ideas that will expand Rogers Motors into new and larger fields just as soon as materials in sufficient quantities again become available.
Until that time, let's cooperate 100% with Uncle Sam.
Cordially yours,
ROGERS MOTOR CO.
C. W. Rogers, Pres.
PHILADELPHIA, PENNA.

Finish the top of the fuselage as shown. Lay the two 1/8" square fairing stringers on each side of the fuselage as shown. Cut all fuselage bulkheads as given in Plate 3 and cement them all in their proper locations.

Bend the single-strut landing gear strut from 3/32" steel music wire to design shown and attach it to a 1/16" thick piece of plywood cut to the shape of lower section of bulkhead D. Cement this to the bulkhead with several coats of cement. Add the lower 1/8" square stringers to the bulkheads. Note that the very bottom stringer is 1/8" x 1/4" rather than 1/8" square. Attach a small tail wheel to the 1/8" x 1/4" stringer with several coats of cement and bind with thread.

Fill in between bulkheads C and D with 1/8" soft sheet balsa. Note that bulkhead D' is not cemented to D; and sandpaper perfectly smooth to simulate the cowling. Insert lengths of 1/8" hardwood dowl to wrap rubber strands on to keep the wing and tail section in place. Cut all necessary holes in the cowling to accommodate your individual motor. No battery box and coil position is given in the plans because these are placed along the main fuselage crutch at points that will balance the model at about the 50% wing chord mark. Note that bulkhead J' is cemented to the center section of the wing and not to the fuselage; this forms the fuselage fairing into the wing.

Cut the stringers between D and D' and along the top of the main crutch through A, B and C to obtain the removable cowling. Each individual motor requires different holes for adjustments and cooling.

WING—The wing is constructed in one piece. You should experience no difficulty in making the wing for it is of the simplest construction.

As was mentioned above we employ the Grant type wing slots. Heretofore this type of wing slot was constructed by the complicated sheet-box method which many builders found difficult to make. Our method is much simpler, we merely use two pieces of sheet balsa of the necessary thickness and carve the required crossection in them. Cover the wing in the usual manner; cut the covering away from the slot openings on the top and bottom of the wings and presto, the slots are finished. Simple?

It is wise to construct the wing over a full size drawing of the wing plan. All dimensions are given on Plate 2. Cut the required number of each rib pattern from medium hard 1/16" sheet balsa. Note that the ribs accommodating the wing slot are made in two pieces.

Since the airfoil used is of the flat bottom type (modified Clark Y for ease of installing the wing slot) all members may be pinned directly on the plans. Naturally you will have to block up the leading edge to meet the rib leading edge. Insert all ribs and cement firmly. Cut wing tips from 1/4" sheet to patterns—given full size in the plans—and install in their proper locations. Carve the wing slot members to required crossection as described above and cement in place, making sure you get an even, smooth contour on the wing surfaces. If there are any bumps, shave and sandpaper them off, otherwise you will spoil the efficiency of the wing airfoil.

Now install the necessary dihedral in each wing tip, noting that there is a flat center section that fits onto the fuselage sub-crutch. Check for any warps in the wing; recement all joints; it might be a good idea to re-enforce the dihedral joint with gussets and other balso members. Use loads of cement at this section.

The real ship has a single strut to brace the wing. The author found there was a great difference in performance with and without the strut, so he recommends that it be left off because it isn't needed for strength. If you prefer to use it, details may be found in the front view drawing.

TAIL SURFACES—Tail surfaces are very simple to construct and no difficulty should be found here.

Pin all members directly on full size rudder and stabilizer drawings. Cut the tips from the full size patterns given in the plans and cement in place. Cut the tail block from 1/4" sheet and note it is cemented to the bottom of the rudder and not to the fuselage.

Send a slight airfoil section into the tail surfaces. Assemble the tail group as follows: cut the small section from the fuselage rear as shown in the plans; cement stabilizer to the very bottom of this section so that there is 0° incidence, using the thrust line as a base line. Now cement the rudder into position onto the top of the fuselage section. Add 1/8" hardwood dowls to wrap the rubber strands upon in the proper positions.

COVERING—The author covered his Curtiss O-52 with gas type Silkspan and then doped it silver. Of course you can use any combination you want but it is suggested that you stick to some type of military coloring.

Tail and wing are covered in the usual manner. Use heavy dope as adhesive; it is necessary to dope only the extremities of these surfaces. It is best to cover the fuselage with wet Silkspan since it is much easier to apply this to the compound curves of the fuselage when it is wet.

Spray the entire covering with water to tighten the covering. Now brush on two or three coats of clear dope. Sand any fuzz with 10-O sandpaper before applying color dope. The author brushed three coats of very thin silver dope, about the consistency of water. This was just enough to give it a solid coloring without adding unnecessary weight.

Control surfaces are shown by strips of black paper doped to the correct positions. Add official U. S. Army insignia which can be purchased at your local model store. The cowling may be painted a contrasting color such as blue or red. Outline the windows with strips of black paper doped to the celluloid cabin.

FLYING—Testing the Curtiss O-52 model should be comparatively easy if you take the necessary precautions and show a little care because it really is a very stable ship. With the incidence required in its proper location and the model free from warps, the ship is glided into the wind, preferably over tall grass. If your model is on the heavy side, remember it will require a stronger heave to make it reach flying speed. It should be test-glided until it glides far and flat.

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TAPERED Leading and Trailing Edges

Keep test-gliding until proper glide is obtained, adjusting the rudder so the ship turns to the right in the glide in a large shallow circle.

You are now ready to test your model under power. Use short motor runs and gradually increase the motor speed on each succeeding flight until you have all the "bugs ironed out." Note how the model behaves, which way it turns under power, climbing angle, glide, and its direction—and of course make all necessary corrections.

With the above adjustments the model should jump from the ground or from your hand a few feet forward, gathering lots of flying speed, and then zoom for the sky in a left or right banking attitude until the motor cuts off; then it should roll out into its excellent glide.

We have tried to present you with as simple a picture of building the scale Curtiss O-52 as possible and hope that it meets with your approval. If there is some point not quite clear, don't hesitate to write the author, care of this magazine, stating your individual problem; enclose a self-addressed stamped envelope.

VICTORY

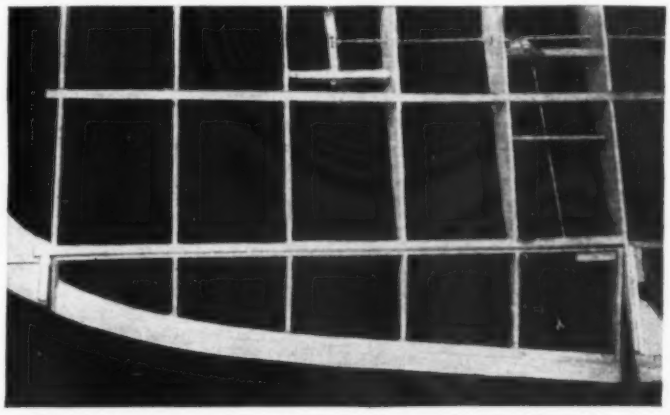
The Phantom Pilot Takes Command

(Continued from page 14)

which can be rendered so stable that it can take off safely in the heaviest of crosswinds and fly with big plane performance. This may be accomplished on any model through the installation of the Vance Automatic Aileron Controls, which make provision for complete lateral stability. The remarkable feature of this stabilizing device is that it does away entirely with dihedral and should be used on a completely straight wing, which not only provides a greater strength factor for the same weight wing but also gives more lift and less sinking effect and enables the model to perform like a large-scale plane.

The following is an explanation as to how the automatic controls function. They are extremely simple to build and install, and will definitely prevent slipping and spinning in your model. First, as has been previously stated, the wing should preferably have no dihedral. If the wing is tapered, make the uppersurface straight and the bottom of the wing taper toward the top. If the model builder desires to do so, he may have a small amount of dihedral in the wing. The shape and size of the wing and its airfoil section are entirely optional and will in no way affect the installation and operation of the controls. Movable ailerons should be built into the wing.

There are two small fins hinged vertically at point of contact to the wing approximately one-fourth of the wingspan in from each wing tip, and approximately one-third of the chord behind the leading edge, so that they are free to move in the direction of or away from the fuselage. Next, they are connected to the ailerons in such a manner that the particular aileron in question will be depressed when its corresponding fin is moved toward the fuselage, and raised when the fin is moved away from the fuselage.



Wing and aileron structure showing mounting of control fin and connections that tie together and operate the ailerons

These finds must be absolutely neutral to the designed airflow past the plane, which is from front to rear (i.e. parallel to the rudder). In this position, they operate only when and if the designed airflow changes from normal. The process of circling the plane may be accomplished by adjusting the rudder in the same manner as with a conventional wing.

When an automatic-control equipped model, in flight, manifests a tendency to

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See page 51

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slip one way or the other, an air pressure is invariably exerted upon a side of each fin which will in turn cause the ailerons to perform their natural functions, thus righting the ship. The entire action is completely automatic and instantaneous, and performs the principal duty of a pilot in a large scale ship.

The fins may be hinged at either top or bottom of the wing; however, it is preferable to hinge them at the bottom, excepting in those rare instances where the wing is so low that there is the existing possible danger that the fins may hit the ground. It is well to bear in mind that a fin should be approximately one-third the area of an aileron and have an aspect ratio of about two to one, or higher. At the start, it is more advisable to have the fin a little too large than a little too small; and if the plane tends to overcontrol or to rock sideways, the fins may be cut down slightly in size until this fault is eliminated.

In a demonstration before the Army Air Corps at March Field, California, a low-wing model of original design flew straight through the center of a whirlwind with a diameter approximating 12 to 13 feet. The plane itself did not even tend to wiggle, and the only noticeable change was the distinct revving up of the motor as it passed through the exact center of the whirl.

The authors, wishing to see how this stabilizing device would operate on a low-wing high speed model, constructed a five-foot scale replica of a Caudron Cyclone, powered with a Super Cyclone motor. The plane is capable of flying at a remarkably rapid pace, which is estimated to be about 70 or 80 miles per hour. Its flights are characterized mainly by their astounding exhibitions of stability under variable wind velocities. Its climb is very similar to that of the Lockheed P-38. And do not forget that it is a low-wing model with absolutely no dihedral!

Incidentally, those who are particularly interested in the reproduction of true scale models should be especially pleased with these controls since they do away with the excessive dihedral ordinarily required; as a result, with the use of these controls, this deviation from reality would naturally be eliminated.

The automatic controls are extremely well suited to radio controlled gas jobs and will be considered a tremendous boon in this field. The reason for this is easily perceived, for they do away entirely with the necessity of aileron control by radio and make perfect banks possible merely by the use of the rudder control.

These automatic controls are adaptable to any model plane; but care should be taken to secure the correct balance of the ship. In a changeover from a dihedraled to a straight wing on the same fuselage, the wing will probably have to be shifted back slightly, due to its increased lift and change of center of pressure. Be sure to have the wing square on the fuselage, and see that it is fastened securely enough so as not to slip. If the wing accidentally gets cocked to one side, straighten the wing and glide the ship before you send it up in flight. If the ship has a straight glide, you can then be assured that it will fly perfectly level. If the ship is flown with the wing cocked around or the rudder set for a turn, it will fly in a circle and have perfect banks. Do not try to circle the plane by cocking the wing. Always adjust the rudder accordingly.

After everything is balanced and adjusted, the builder will have a plane that is capable of flying in any type of weather and will be able to take off, down, and across in heavy cross winds safely. It will be noticed that as soon as the wheels leave the ground the plane will usually head into the wind. This should make it ideal for contest work.

There is another device we have been using which controls the elevators and prevents stalls and dives, assuring complete longitudinal stability; but we have decided to withhold information about this until the model builders acquaint themselves with the lateral controls. Possibly in the near future we will be in a position to fully describe the installation of the elevator control. Then the model builder will be able to have a complete automatic pilot in his model, similar in action to the large scale ships.

Meanwhile, anyone desiring further information in regard to the lateral controls should not hesitate to write to Leo or Joseph Eckstein c/o MODEL AIRPLANE NEWS.

VICTORY

Midway's Avenger

(Continued from page 27)

chine-gun slugs, as U.S. Naval Air Power went into action. Sweeney's men raced to the attack and Marine Corps dive-bombers dropped towards the leading cruisers and destroyers. Make-shift Army torpedo-planes (four in all) swooped down low against the Jap ships as the Nips carrier-based fighters rose in a swarm for battle.

And through this maelstrom of death and destruction rode the fierce new naval weapon, the Avengers wrath tearing holes in the leading vessels. These fiery aerial steeds blasted their way through the swarms of Japanese fighters, smashing them aside with the power of their power-driven turrets, plunged down to the very wave crests and let loose their terrible missiles of death: torpedoes!

In haste the Japanese planes were forced to withdraw from the vicinity of the island to protect the fleet, quickly being hammered to destruction. With the threat to Midway relieved, the Americans proceeded to pound the Japanese fleet unmercifully until, in full retreat, the vessels disappeared over the horizon leaving four of the carriers useless hulks and forcing many of the Jap planes to land in the sea and on the island's airport in abject defeat.

Included among the carriers known to have been destroyed was the very latest "mystery" vessel of the Japanese Fleet, the Ryukaku. This mighty vessel, launched during 1941 from the Kawasaki shipyards at Kobe, had a displacement of 17,000 tons and a length of more than 800 feet (Enterprise and Yorktown class, approximately). One of three of its type, the Ryukaku had the latest equipment for launching aircraft, adequate armor protection and secret anti-plane defenses supplied to

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MODEL AIRPLANE NEWS CENSUS
551 FIFTH AVENUE ... N.Y.C.

them from the German naval offices. It was armed with sixteen 5-inch guns and was the pride of the Japanese Navy.

Thus the victory assumes important proportions, for this was no mere converted "tub" our Naval aviators sunk, but the latest and most powerful vessel of its type afloat. More significant, however, is the fact made clear in reports that no American naval vessel was in sight or even in range of the Japanese Fleet at any time during the action. This was entirely a battle between air power and sea power on war's proving ground of steel against steel with no holds barred, no rules or regulations, no methods of scoring other than death and destruction. That no naval vessel can operate against the enemy without adequate aerial protection has been thus proven in blood and fire. The hammering our torpedo planes and bombers gave the four Japanese carriers is testimony to the superior fire-power, maneuverability and destructiveness of the modern military airplane. And testimony to the strength, speed and utter potency of the new Grumman "Avenger," now Pride of our Naval Aviation—and our Plane-on-the-Cover this month.

With this plane, aviation has proven its case, for the airplane is the only weapon used by our Navy which did not get a chance to prove itself in the last war. As we told you in the May 1942 issue ("Axis Devastator") the torpedo-carrying airplane was not born until after it had missed its chance for battle on Armistice Day November 11th 1918. Its development continued erratic but determined through the 'twenties until 1936 when Douglas produced his famous "TBD" type now known as the "Devastator." For its day it was a remarkable airplane, hauling a torpedo, three men and standard equipment into the air at a speed better than 200 miles per hour. In the early months of the war, particularly in the Coral Sea battle as well as in the Macassar Straits, the TBD did gallant work with the carriers of the U.S. Pacific Fleet. But progress has forced it to make way for a newer, faster and far more deadly plane of its type, the Avenger.

Chief drawback to torpedo-carrying airplanes in the past, in addition to the terrific 1,000-lb. weight of the torpedo, was the necessity for fitting the awkwardly long and thin capsule to the underside of the ship where it not only caused considerable trouble from the standpoint of weight and balance (affecting maneuverability), but it increased the drag of the airplane tremendously. The TBD succeeded in stowing the bulky torpedo partially on the interior with only about three feet of its snout protruding out into the air; but the new Avenger carries its deadly package completely within its spacious belly, the first plane of the type to do this. Thus, its exterior lines are not interrupted and speed is thereby increased.

The Avenger is a mid-wing monoplane of all-metal construction powered by a single radial-air-cooled double-row engine and providing accommodations for a crew of either three or four. The comparatively large crew is a vital necessity for it is mandatory that one man be detailed to handle the torpedo prior to its launching, starting its engine, setting the various controls and seeing that it is freed from the plane properly. In addition, the conventional crew of a pilot and gunner must be carried; and the Avenger, with its lower rear gun implacement requires a fourth man to act as belly gunner on a full-scale tactical mission.

The monoplane wing is built up on a framework of three spars, ribs, spanwise stiffeners and skin plating flush riveted throughout. The wing consists of a center section (spars only continuing through the fuselage), two outer panels and two tip sections. "Square" tips are again used as a result of recent wind tunnel investigations proving the superiority of this "chopped off" design over other types at high speeds. Tip losses are said to be lessened to a marked extent, and most new designs carry this feature on not only the wing tips but the tail surfaces as well.

Conventional ailerons of the slotted types are carried, as well as split, trailing edge flaps running between the ailerons to the wing outer panel attachment angles on the center section. Fixed slots are mounted in the leading edge of the outer panels just forward of the ailerons to provide a larger stalling angle and consequent lower stalling speed, giving the ship good handling characteristics even at the slow speeds necessary for dropping torpedoes.

The fuselage is of oval shape and is extremely "fat" through its middle in cross-section vertical height to accommodate the torpedo bay, the wing and crew one atop the other. The lower mold line breaks sharply at the aft end of the torpedo bay to provide for the belly gun implacement. The aft portion of the fuselage tapers sharply, giving it a soupspoon appearance.

The tail surfaces are of conventional static and dynamically balanced design and the vertical stabilizer has been extended forward along the upper fuselage to provide better longitudinal control and stability as well as better spin-recovery characteristics. The rudder, elevators and ailerons are aerodynamically balanced by controllable trimming tabs.

The upper forward portion of the fuselage is completely enclosed in a moulded transparent plastic material of sliding hatches and fixed enclosures for the crew. The pilot is protected by a laminated plate glass windshield. He is located high and well forward affording him vision in a large angular dimension. He is protected by a sturdy turn-over structure mounted just behind him. This latter is an integral portion of the fuselage and consists of an extension of the vertical fuselage frames as well as a canted member. This overturn structure also supports the antenna mast at its forward end. This arrangement made necessary a fixed member above the pilot's head along which the sliding enclosure moves. The slit along its centerline moves around the mast.

Aft of the pilot is the radio operator and torpedo officer whose seat is collapsible, permitting him to go below to handle the torpedo when a launching is anticipated. Immediately aft of him on a spe-

cial pedestal within the enclosure is the radio compass loop.

The aft portion of the enclosure is faired into the upper gun turret, a large, plastic hemisphere mounted on a special roller mechanism which permits it to operate through 90° elevation and 360° azimuth. This installation varies in different models, the standard type carrying a single .50 caliber machine-gun, the turret hydraulically operated or "boosted" by the gunner's controls. Later models are believed to have special multi-gun power driven turrets installed mounting two .50 caliber weapons or four .30 caliber machine-guns.

The lower gun turret, which consists of a conventional fixed socket arrangement, mounts a .30 caliber machine gun and also serves as an observation post for the lower gunner to record the extent of damage done to enemy ships after the torpedo has been launched.

Power is supplied by a single Wright Double Row Cyclone model R-2600 engine which develops 1400 horsepower at 2400 rpm at 11,500 feet and has 1600 horsepower available for takeoff. This giant engine is equipped with a two-stage two-speed supercharger, the auxiliary blower having a "Low," "High" and "Neutral" position. This type supercharger works similar to the gear shift on an automobile and makes additional power available at high altitudes. It has a cruising horsepower of 1,000, the maximum power available just a short three or four years ago.

The Avenger has a top speed of more than 280 miles per hour, better than 50 miles per hour faster than the Douglas type which it is fast replacing. It has a range of 1,400 miles and a load capacity of either a single torpedo or 2,000 pounds of bombs, making it possible to use the big ship also as a bomber. It has a fighting ceiling of more than 25,000 feet, providing high altitude operation when attempting to surprise an enemy fleet as well as eluding the prying eyes of protecting fighters.

The Avenger is not a suddenly conceived and executed design, for it has been under construction in experimental form for two years. The XTBF-1 was thoroughly tested and many radical changes made before the final production design was arrived at. However, once the type was in production no time was lost in getting it into service and only four months elapsed between the time the first production airplane rolled from the Grumman Aircraft factory and Avengers were on duty with the fleet at Midway Island.

Many will remember the graphic account of the Midway Battle given by Ensign George H. Gay, Jr., who witnessed the battle while floating in the sea after his Avenger had been shot down. Ensign Gay successfully delivered his torpedo into a Nipponese aircraft carrier and was pulling up and away when a Japanese fighter caught his ship square in its gunsights.

Large numbers of the Grumman Avengers are now rolling off the production line and are being hurried into service with our greatly expanded carrier fleet. It is a truly powerful and deadly airplane and will most certainly play its

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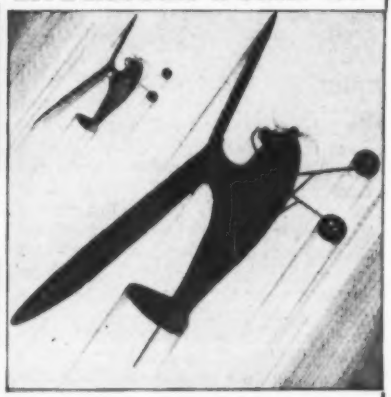

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part in the coming battles in the Pacific, battles of torpedo-carrying airplanes against the battleships, cruisers and destroyers of "Hirohito's Heels." And if the swift work it has done to Japanese aircraft carriers is any indication, the Jap Fleet is in for a terrible shellacing at the hands of this merciless Avenger.

VICTORY

Fly the "Missing" Link

(Continued from page 29)

flat where the tail surface is cemented. Cut the cockpit rest block from medium balsa, rounding off the front and cementing it in place. Extra coatings of cement will keep it from breaking off during rough landings. The wing should fit snugly in place between the cockpit and wing rest blocks. Also make sure that the fillet block fits the wing undercamber.

Next cut out a section of the fuselage and hollow a housing for the lead balance. The amount of lead depends upon the weight of other parts of the model. Simply add enough to bring the complete model up to the required weight; it should balance at approximately where the lead is situated. Keep the weight securely cemented in place so as not to shift the C.G. in flight. Now cement back in place the section which was cut out of the fuselage. Finer balance adjustments can be made by the use of clay on the nose or tail of the model.

Cut the cockpit cover pattern from thick celluloid and cement in place. For the tow cord, bend two hooks from .040 wire and cement securely in place. The complete fuselage is then sanded until a smooth wood surface is obtained. Then give it about six coats of a clear dope and sand lightly between each. Try using a little more effort on the last coat, sanding lightly and evenly. You should obtain a smooth glossy surface. A few coatings of cement on the nose will keep it from wearing. Do not color dope the fuselage until the tail surface has been cemented in place.

STABILIZERS-RUDDERS—For the stabilizer, cut the required ribs from soft sheet balsa and cement to the spars. Next cement the bamboo tip in place. A thin top rudder section is employed with 1/8" square ribs. Shape the 1/8" soft sheet bottom rib to fit the top section of the stabilizer airfoil. Cover the rudder and stabilizer with a light bamboo paper. Next water spray them and leave to dry. Two coats of a clear dope should be used for tightening the paper.

The bottom rudders are shaped from 1/8" sheet stock. They are then cemented at their stabilizer positions. Make sure they are cemented to the ribs and not only to the paper. Give them three coats of dope, sanding lightly between each. If you like, give them two coats of a colored dope.

ASSEMBLING-FINISHING — Cement the stabilizer to the fuselage, making sure that it is lined up with the wing. It is set at a zero degree incidence angle. A few extra coats of cement will keep it securely in place. Next cement the rudder to the stabilizer and fuselage. A cement fillet formed at the points of contact of the

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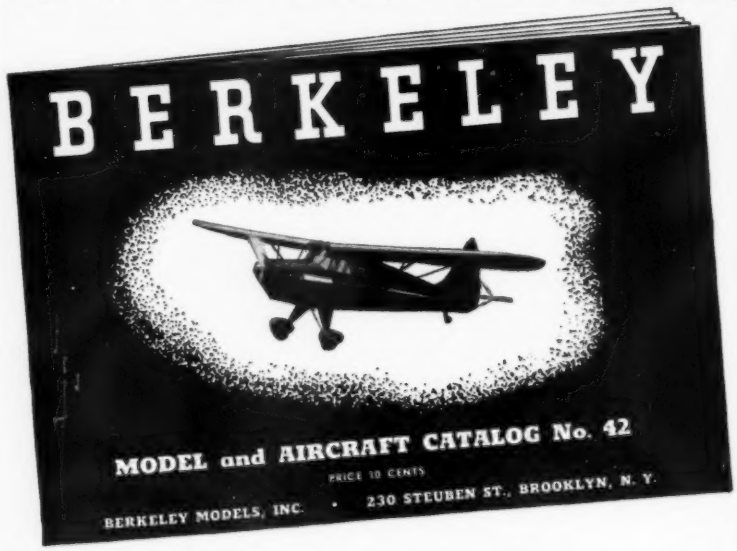

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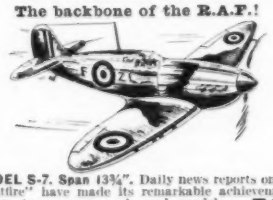

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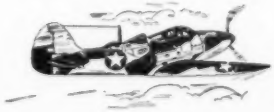

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rudder, stabilizer and fuselage will eliminate any vibration.

The color doping of the glider is all that remains to its completion. As to the color scheme, that is left to the taste of the builder. Give the fuselage two coats of a colored dope, sanding lightly between each. Three coats of a good polishing wax will give a smooth, glossy surface. Colored papered wing and tail surface trimmed with a colored dope will give a fine appearance.

FLYING—First slip the wing in place, holding it on with rubber bands; it should nestle firmly in place. The Link should balance where the weight is situated. All surfaces should have a zero degree of incidence angle. Test glide the model from a shoulder high position. If it should glide with the tail slightly high, add a small amount of clay to the tail. The model should be made to glide in a flat but tight turn. This results in a ballooning type glide, taking advantage of the slightest atmospheric aid. In many a flight the Link has soared overhead for minutes at a time at an altitude of only one hundred feet!

You've probable wondered about the tow hooks located on the side of the fuselage. They are placed there so the tight flight turn of the glider is offset while being towed. In other words a tight left turn would be neutralized since the model would be pulled to the right; when released the glider would resume its flight turn. The best way to tow a glider to obtain maximum altitude is to tow a few feet at a time. If the glider does not tow straight, but shows a tendency of circling to either side, slacken the tow cord which straightens it out. Simply repeat this procedure until the glider reaches its maximum altitude for tow cord length.

After obtaining some skill with this type launch, heights of 80 to 90 feet can be reached. For windy weather use the front hook. The rear hook is used for calm weather flying. In towing your model, just remember that to prevent crashes it is better to tow slowly and surely rather than fast. A good point about this type model is the small amount of flying accessories needed. The only equipment is a tow cord and the usual contest kit. Some sort of vehicle with which to pursue the Link will also come in handy. Don't forget to do your part in boosting American model aviation.

VICTORY

Air Youth

(Continued from page 20)

Holyoke, Mass.

Sept. 20, 1942—Denver, Colo. Record Trials of Exchange G.M.C. of Denver at Club Flying Field; Prizes $10 cash; 25 expected; CD L. W. Fick.

Oct. 4, 1942—Steubenville, Ohio. Class A Sky Hawk Meet; Gas Combined & Rubber Combined; Prizes—trophies, medals & merchandise; CD Frank Barilla.

Oct. 10, 11, 12, 1942—San Francisco, Calif. Class AAA Calif. State Championships; Held at Lake Mercedable Field, S. F. State Teachers College; R.O.W. Gas, R.O.G. Gas; R.O.G. Rubber; Prizes—trophies & ribbons; 200-300 expected; CD Dr. Irving A. Dundas, Chm. S. F. Exchange Jr. Aviation Com., 291 Geary St., San Francisco, Calif.

Oct. 11, 1942—Ardmore, Pa. Class AA Gas & Rubber Meet for Main Line Golden Eagles at Grand View Farm; CD Everett Powers, 746 Panmure Rd., Haverford, Pa.

Oct. 18, 1942—Denver, Colo. Record Trials of Exchange G.M.C. of Denver at Club Flying Field; Prizes, $10 cash; 25 expected; CD L. W. Fick.

November 15, 1942—Seattle, Wash. Seattle M.A.C. Meet at Univ. of Wash. Pavilion for Pacific Northwest Rubber Model Championships: Class AA; All classes of powered models & gliders; 50 expected; $25 merchandise awards; CD Roger Brengman.

Appointment of Air Youth Women's Auxiliary Officers Announced

Mrs. Clarence Norton Goodwin of Washington, D.C., has been named Chairman of the newly formed Women's Auxiliary of N.A.A.'s Air Youth Division by the Air Youth Executive Committee of which Dr. George W. Lewis is Chairman. Mrs. Robert P. Patterson, wife of the Under Secretary of War, and Mrs. Harry T. Jordan of Philadelphia, Junior Air Reserve Wing Commander for Girls and Liaison Officer between the Girl Scouts and J.A.R. will serve as vice chairmen.

One of the principal functions of the Women's Auxiliary of Air Youth will be to help the mothers of the nation realize the importance of an air-conscious American youth in winning victory and maintaining peace. The "WAAY" will also cooperate in encouraging the adoption of aviation education courses in public schools throughout the country.

Junior Air Reserve Program Being Speeded

The N.A.A. Junior Air Reserve program is now speeding ahead as the result of action taken at the Air Youth and N.A.A. Board meetings in New York. A committee was appointed under the chairmanship of Stanley C. Draper of Oklahoma City. Serving with Mr. Draper is Clifford W. Rogers, president of the Model Industry Association and William P. McCracken, Jr., former director of the Bureau of Air Commerce and present N.A.A. counsel.

H. L. Eddy of Oklahoma City, an observer at the meetings, has been in Washington this week interviewing officials in order that he may take back to Oklahoma a complete picture of what the Civil Aeronautics Administration, the Office of Education, and the National Aeronautic Association are planning for youth aviation education in the schools and in extra-curricular activities. Mr. Eddy has devoted 20 years to the direction of youth activities and is anxious to aid the Junior Air Reserve.

The first Junior Air Reserve Group Command in the Southeast has been established at Avon Park, Fla. under the leadership of W. C. Pidgeon, Director of Academics at the Lodwick Aviation Military Academy.

Mr. Pidgeon says: "The American Legion, Rotary Club, Women's Club and the Lodwick Aviation Military Academy are behind this Air Youth Program. The academic department staff are donating their services to Air Youth work and are instructing boys and girls in class work as well as in the building of model airplanes and miniature Naval ships."

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No. 5 VOUGHT SIKORSKY.

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FLYING SCALE MODEL (CURTISS P-40 Illus.)
RUBBER, CEMENT
FINISHED PROP

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9" & 36" cost twice 18": 3x36, 4 times
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Minimum 50c
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1/32x3/16 .....8 25c
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3/16 sq. 6 25c
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Sheets, 4 times 18".
Double the above price for genuine aircraft SPRUCE
18" Balsa Planks
1/32x1/2 ....3 for 10c
1x1 .....each 10c
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2x6 .....each 89c
3x6 ....each $1.25
Plastic Balsa
4 oz. 29c, Tube 10c
PROP. BLOCKS
1/2x 3/4x5 4 5c
1/2x 3/4x 6 3 5c
5/8x 1x 8 2 5c
3/4x11/2x10 ea. 3c
3/4x11/4x12 ea. 4c
1x11/2x12 ea. 6c
1x11/2x15 ea. 9c
Plywood—1/16
1/8,3/16,1/4 40c ft.

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Ohlsson "19" $16.00
Ohlsson "23" 18.00
New Ohlsson "60 Special" 20.00
Cannon 'B' $18.50, 'C' 19.75
Elf "A" $21.50—"Twin" 34.50
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Rogers "29" $14.00—"35" 14.50
Mighty Midget 12.50
Gwin Aero $15.00, Tiger Aero 18.50
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TRADE-INS ACCEPTED! TOP CASH VALUE ALLOWANCE for old motor towards purchase of a new one!

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CLEAR DOPE THINNER
Banana Oil
1 oz. 6c, 1/2 pt. 40c
2 oz. 11c, pint 60c
Colored Dope
1 oz. 6c, 2 oz. 11c
1/2 pt. 45c, pt. 70c
MICROFILM RUBBER LUBE WOOD FILLER LIQUID CELLULOID
1 oz. 9c 2 oz. 15c

G. M. SILKSPAN
White, Red, Yellow, Orange, Blue
3 for 25c.—"OO" —5c per sheet.
Gas Model Silk
H'vy qual. 75c yd.
AA TISSUE
All col., doz....35c
Silver, ea.....5c
Supersilk, wh. 5c
Bamboo Paper
White 6c, 5 for 25c
Colors, 2 for 15c

Trexler Wheels
1¼, 1½—45c
1¾, 2—55c
2¼, 2½—66c
Gas Mod. 2¾-1.10
3-1.40—3½-1.65
4¼-1.95
M&M WHEELS
1¼, 1½, 1¾ 60c
1¾, 2 2½ 70c
Gas Mod. 2¾ $1
Flyweight " 85c
NEW 3" $1.10
3¼ 1.60, 3½ 3.00
Tin Water Sprayer.....5c
PROPELLERS
Balsa Paulo Ritz Wina Gas
5" 4c-10c Mod.
6" 5c-10c 8"40c
7" 6c-15c 9"40c
8" 7c-17c10"40c
9" 8c-21c11"40c
10" 9c-25c12"40c
12"10c-30c13"40c
14"12c-50c14"40c
15"15c-60c15"50c
16"16c-X 16"50c
18"25c1.25 18"65c
RITZ Gumwood
8"-9"-10"-11" 20c
12"-13"-14" 20c

GAS MODEL ACCESSORIES
Champion Spark Plugs 3/8 or 1/4 50c
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Terminal Clips 1/8" 10c val. 4— 5c
Gas Funnel, Copper strainer.....30c
Spaghetti Tubing 1/16" 3 ft.—10c
Toggle Switch 25c, Lightweight.15c
SAE 70 oil—1/2 pt. 25c, Pint...40c
12" High Tension Leads—Best...15c
18 strand H.T. leadwire, 3 ft....10c
Booster Leads per set 75c value.50c
Masking tape—1/4x36-Instruc. card 5c
Alligator Clips—2/15c Solderless.10c
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Nickel plated 50c. Streamlined $1.00
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1/4x1/2 .....20c ft.
3/4x3/4 .....30c ft.
RITZ FOLDING PROPELLER
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ALUM. TUB'G per ft. 1/16....8c...16c 3/32, 1/8...10c...15c 3/16, 1/4...15c...18c
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Model Pins 1/2 or 1" 100 for.....8c
Sheet Celluloid 5x7 5c, 14x17....30c
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MUSIC WIRE
.014 .....2 ft. 2c
.020 .028 3 ft. 3c
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1/16" .....3 ft. 6c
3/32" ....3 ft. 10c
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BROWN RUB'R
1/16 sq. 6 ft. 5c
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Skein 200 ft. 1/16, 1/8....$1.25 3/16 .....1.75
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Med. 8c, Lge. 10c
Small 5c, Gas Mod. 20c
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1/2 doz. Lge. 12c
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1¼" 10c, 2" 15c
2½" 20c, 3" 25c
4" 65c, 4½" 75c
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3/4" 3c, 1 1/4" 4c
1 1/2" Lewis.... 8c
1 3/4" Lewis.... 6c
1 1/4" Ring Mt. 15c
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N.A.C.A. Labs

From the N.A.C.A. Aircraft Engine Laboratory in Cleveland, Edward R. Sharp, Administrative Officer tells us: "We already employ about 25 modelmakers here in our shops which are now in operation. The boys have formed the AERL model club, called it the AERL-eers, and they have given me the attached information to send along to you to show the set-up of the club. Of course, they contemplate affiliation with the Academy."

From the "attached" information, we learn that Ray Campbell has been elected President; Bob Reich, Vice President; Clifford Mone, Treasurer, and Eddy Sharp, Corresponding Secretary. Also we learn that Mr. Sharp has donated a trophy which will be awarded annually to the "AERL-eer" who accumulates the highest number of points in all approved contests.

Industry Committee Sees Changes in Models

The Model Industry Committee of the Academy of Model Aeronautics, whose chairman is Harold F. Auler of Milwaukee, recently submitted the following report to the A.M.A. Contest Board—

"The Model Industry Association wishes to bring to the attention of the Academy Contest Board the following, which will tend to have a direct bearing on future weight rule changes and model flying regulations:

"The Academy Contest Board should bear in mind that model planes in the future will undoubtedly be heavier, brought about by the conservation or elimination of balsa wood, aluminum and other items to a certain degree. The impending shortage of these materials in planes and motors must be met by a strict conservation program by the manufacturers.

"We wish to point out to Academy leaders, Contest Directors and other personnel directly connected with the flying of model planes that models in free and uncontrolled flight over communities or cities may arouse Civilian Defense Air-Raid Spotters and cause a state of alarm and confusion. Heavier models will help to eliminate such occurrences.

"Cooperation along these lines will help to keep this great hobby alive and to the front, and we are sure that model builders of the U.S.A. and adjoining countries will cooperate so that we can continue to 'Start 'Em Flying and Keep 'Em Flying'!"

Sanction Certificates Will Include Name of Sponsoring Organization

It has been the custom of the Academy headquarters when issuing sanction certificates to issue them in the name of the Contest Director. This has been done because it is the Contest Director that the A.M.A. Contest Board holds accountable for a well-run meet and one which follows all official rules and regulations.

In several instances, however, sponsoring organizations have felt left out of the picture because its name was not included on the sanction certificate. Headquarters did not mean to imply this, of course, and consequently is adopting a new policy in issuing sanction certificates. From now on the certificate will bear the name first of the sponsoring organization and secondly of the Contest Director. The Contest Director will continue to be the individual, however, to whom the Contest Board will look for reports on the meet. The Director will continue to be individually responsible for all activities in relation to the meet as far as headquarters is concerned.

VICTORY

Sky Scouts

(Continued from page 34)

friends who will organize Sky Scouts. You see, I live 20 miles from Las Cruces on the Corralitos Ranch, so it would be difficult to form a unit in Las Cruces. However, I am sure my friends, both boys and girls, will form such units."

This is the right spirit and we wish Bissell lots of luck and hope to hear that he has formed a number of units in the near future.

Don R. Christiansen of 702 4 Avenue E., Oskaloosa, Iowa, is interested, probably like many other Sky Scouts, in securing extra silhouettes. Christiansen write:

"I would like to have silhouettes printed on separate paper so I would not have to cut up my magazines. Also, the table in the July issue was swell."

We can answer this letter and John Conkling's at one stroke. Extra silhouettes are easily made and good training is gotten in making them. Here is the suggestion:

Get some thin tracing paper, a good grade that won't tear easily. Place it over the silhouettes and trace the outline and details in pencil on the tracing paper; then, with India black ink, carefully ink them in. This will prove a very interesting and instructive pastime.

If a club unit desires extra silhouettes each member can be assigned a certain number of silhouettes to trace and ink in; this will reduce the labor of any one member. When a complete set of silhouettes

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Famous plane. 50 inch wing span. 11 inch propeller. For Class "B" motor. At dealers, **Kit, $3.75**

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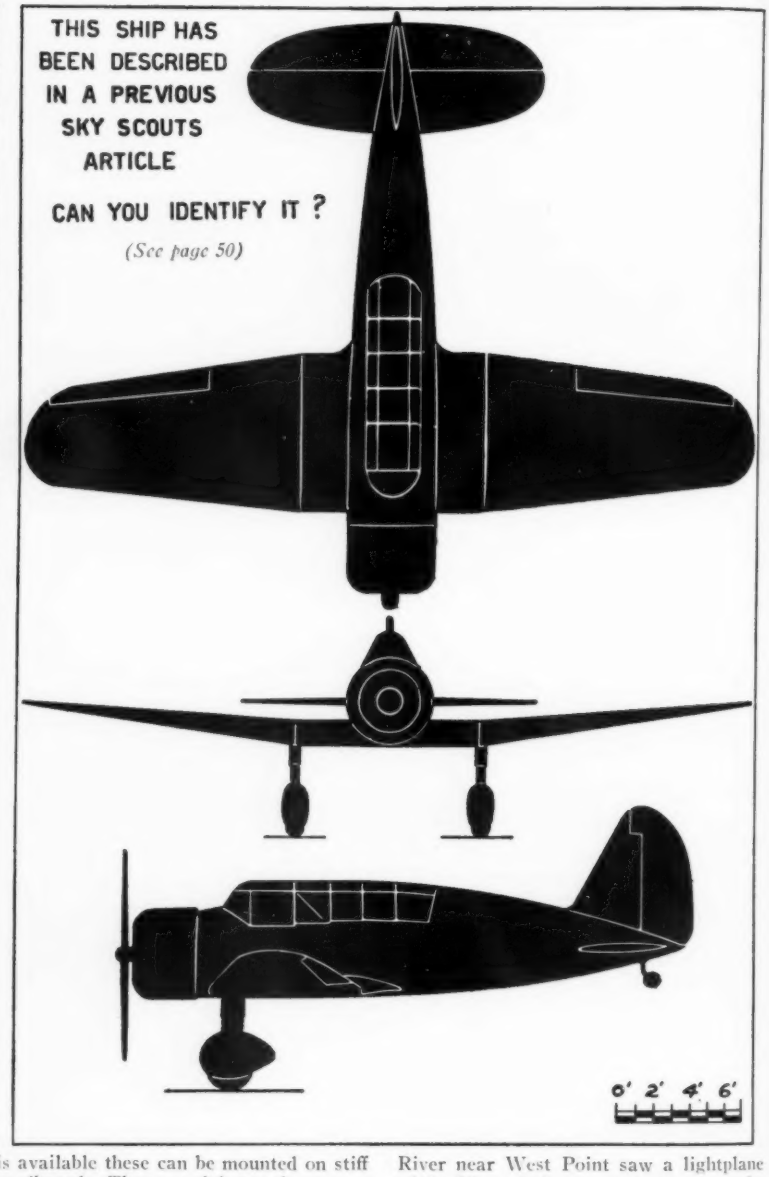

is available these can be mounted on stiff cardboard. Then, at club meetings, contests can be held to determine the skill of each member as a spotter. The silhouettes can be hung up on the side of a room, each member having a chance to write down the correct answer to the various silhouettes. Then the answers may be read to the club and discussed, with perhaps prizes for those who give the best and most complete answers.

In this way silhouettes can also be made of other planes appearing in MODEL AIRPLANE NEWS as well as those in the Sky Scout articles. For instance, 3 views can be traced and then filled in with black ink.

This month you will find near the end of this article, silhouette 3 views of three planes. See if you can "spot" them. Answers are given at the end of the article.

James Slater of 46 Park Drive, Valley Stream, N.Y., sends us a story of an interesting incident which happened recently:

"Sometime ago spotters on the Hudson River near West Point saw a lightplane of the Piper Cruiser type circling over the river apparently with no place to go. They were suspicious as well as anxious to fulfill their duties as spotters so they reported the incident to Army headquarters who were surprised and thanked the spotters profusely.

"In about 10 minutes two P-40 pursuit planes came speeding over the horizon and forced down the sportplane. It was found that the men in the small plane were German spies taking pictures of an island in the middle of the Hudson River in which ammunition is stored."

This is an excellent illustration of how useful spotters can be; and one such isolated incident makes it worth while for the time and care spent by thousands of spotters.

Silver Sky Scout pins have already been sent to all those who have submitted two sets of correct answers for the silhouettes appearing monthly. Also cards have been sent to Scouts who are one of a group in

1/2

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any community. On these cards are listed the names of all other Scouts residing nearby, thus enabling them to form a Sky Scout unit. Each Scout can learn much more about enemy planes if he belongs to a group.

It is suggested that meetings be held to study distinctive features of the various ships; if desired, models can be made of these ships and hung up in the clubroom.

All Scouts must send in 12 correct sets of answers, one appearing each month, to become an Expert Sky Scout: then those qualifying will receive a gold Sky Scout pin. Seven sets have been published previous to this installment.

If you have not already joined this patriotic group do so now by studying the silhouettes and carefully reading their description given here. Then write out the correct names of the various planes and send your answers to Sky Scouts, MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York.

So that newcomers will be able to send in correct answers of all the previous installments, they will be republished from time to time. A complete set was published in the July issue; another complete set will be published in the October issue. Send in your answers to these back silhouette installments as soon as possible; you will receive your silver pin as soon as two sets of correct answers have been received from you.

When Scouts qualify by sending in 12 complete sets their names will be sent to their defense headquarters with explanation of their qualifications to serve as airplane spotters in their community. In this way young Americans can render vital service to their country.

The description of the silhouettes given with this lesson appear on page 34.

ANSWER TO THE MYSTERY SILHOUETTES

The four-motor plane shown in 3 view form, page 34, is the famous Flying Fortress, Boeing B-17E, in the East Indies commonly called "Old Indestructible" because it is nearly impossible to shoot it down. Many of them have been shot full of holes and still keep flying. The name of the single seater Jap plane shown in 3 view silhouette, page 48, is the Nakijima 98.

VICTORY

Modeling Your Future in Aviation

(Continued from page 10)

justment.

Even though the plane may be in adjustment it may not glide steadily if it is thrown too hard. In this case it may follow path B, zooming sharply upward then diving. The toss should be just hard enough to give the glider normal flying speed. If it zooms along path B when thrown gently the glider is slightly tail-heavy; weight should be added to the nose and an additional small brad inserted into the head of the bird beneath the bill. If the zooming tendency is slight the rear of the stabilizer may be curved down a little to increase tail lift.

If the glider follows path A, diving sharply into the ground when properly launched, the nose is too heavy and should be lightened by taking out some of the nose weight. This condition may be corrected also by curving the rear of the stabilizer slightly upward.

Make these corrections and test-fly the glider again, repeating until a normal flight results. Turns to the right or left may be corrected by bending the rear edge of the fin to the left or right.

Some modelers find it difficult to adjust and control the glider by bending the rear edges of stabilizer and fin because often these surfaces will spring back to their original shape. In this case paper elevators may be cemented to the rudder's rear edge, as in Fig. 15, and to the stabilizer, Fig. 16. It might only be necessary to add a rudder to the fin or elevators to the stabilizer.

To control flight direction only add a rudder to the fin. For difficulty in controlling a tendency to zoom upward or nose dive, attach elevators to the stabilizer.

Both rudder and elevators are made of two sheets of paper cemented together and to the rear edge of their particular tail plane; the front edge of one sheet to one side of the elevator or rudder, and the second sheet to the other side. When dry these paper control surfaces may be bent one way or the other to control the flight.

They operate similar to the control surfaces of large full scale airplanes. To give a nose-up tendency, turn up the elevators slightly. Bending them down causes diving or flattens the flight. One up and one down produces a rolling tendency to the right if the right elevator is bent up more than the left. Bending the rudder to the right or left produces a right and left turn respectively.

After becoming thoroughly acquainted with the glider's flight characteristics much can be learned about controlling it by experimenting with control surfaces set in different positions.

Accurate adjustment is an art requiring considerable practice, but it is interesting and instructive. Above all it teaches valuable lessons in flying.

Often, adjustment of control surfaces for correct flight is very delicate and baffling to a beginner; they are usually more out of adjustment than in, because positions do not remain fixed from one flight to another. This requires careful checking before each flight. Consequently if the glider flies well without the control surfaces they should not be added unless the modeler wishes to experiment.

After the glider is properly adjusted for straight gentle glides, longer flights may be obtained by throwing it, the altitude attained depending upon the throwing force.

If it is thrown straight up with considerable force, the wings horizontal and not tilted, the glider will loop. If it hits the ground before completing the loop bend up the elevators slightly; this turns up the nose of the glider more steeply and tightens the loop.

The longest glides result from throwing the glider upward at about 30 degrees tilted slightly to the right, as shown in Fig. 17. When tilted the glider zooms upward but simultaneously turns to the right, climbing in a right spiral and finally at the top levels off into normal flight. This type of launching gives considerable altitude when properly executed and the model is in correct adjustment.

If the model climbs spirally to the right and then dives when launched in this manner, the elevators should be raised slightly. This tightens the spiral and helps the model to level off at the crest of the climb.

Left-handed persons should tilt the model to the left because it is impossible to throw it properly when the glider is turned in toward the body.

The glider may be thrown even more steeply than shown in the figure. With proper tail adjustment when thrown vertically it levels off quickly at the maximum altitude and then glides gently to a landing.

If the little ship persists in diving even though attempts are made to correct it by raising the elevators, turn the rudder to the left; if thrown left-handed, turn it to the right.

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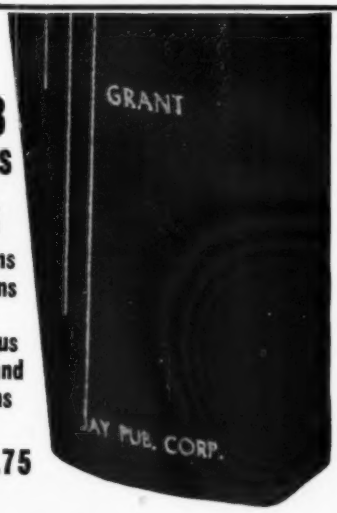

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The Author

CHARLES HAMPSON GRANT

—Princeton Engineering School; Massachusetts Institute of Technology; member of the "Early Birds"; for 20 years the world's foremost model flying authority; for the past ten years Editor of MODEL AIRPLANE NEWS.

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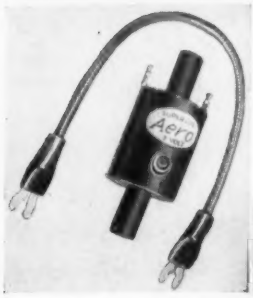

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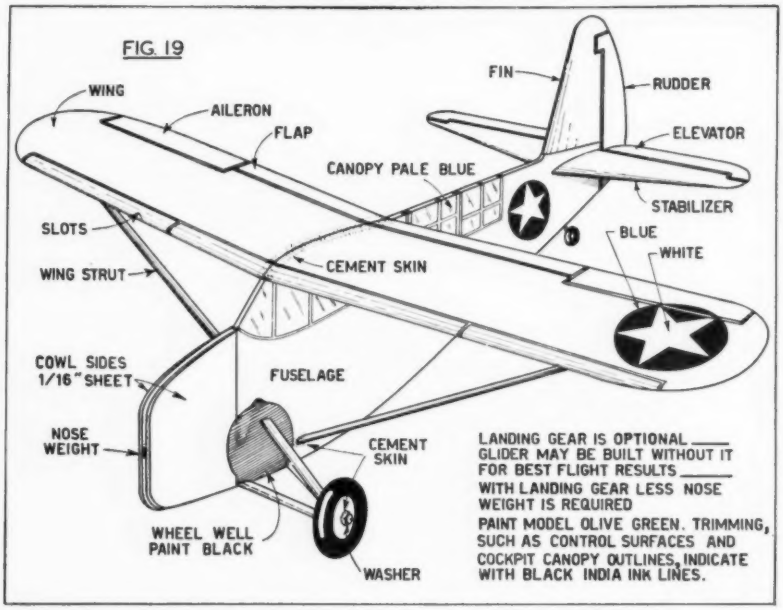

The next step in your flight experience is launching the glider with a catapult. This consists of a stick about 1-1/2' long stuck into the ground, the rubber attached close to the upper end to act as a slingshot for launching. Use about 4' of 1/8" flat rubber for the catapult; tie it into a loop and then fasten one end to the top of the stick. Engage the other end of the loop with the hook on the forward part of the glider fuselage, as in Fig. 18.

Grasp the tail of the glider gently, draw back and tilt it slightly to the right as in the throw-launch. Keep the glider close to the ground so the catapult rubber slants upward slightly. When the glider is released it should follow the path indicated in Fig. 18.

Stretch the catapult rubber only slightly on the first flight, gradually increasing the stretch with each succeeding flight until the desired launching force is obtained. If launched with great force before the model is properly adjusted it may result in a crackup. Follow this procedure precisely and carefully, observing the glider's action with each flight. By doing this you will gradually acquire the art of adjusting the ship for the flight desired.

It is not necessary to press the stick into the ground, the catapult launching stick may be held in the left hand and the glider in the right. This will allow steeper launching, nearly vertical, if desired.

Breakage is bound to occur sooner or later but the little ship may be repaired easily by using cement to fasten the parts together again. This is the great advantage of using balsa in construction; it is quickly and easily repaired.

The only difference between a bird and an airplane lies in its structure and size; both operating on the same flight principles and embodying similar functional units. This is vividly illustrated in Fig. 19, showing a silhouette model view of the Curtiss O-52 Army observation plane. You will note how similar it is to the bird glider; the wing is high, fastened to the top of the body, tail surfaces are in approximately the same position and the motor compartment and propeller shaft, replacing the head and bill.

Plans for this little ship appear on page 9. In constructing the model follow exactly the same procedure as in the case of the bird glider. All operations are similar, the only difference being in details of the outline and decorations which give your glider the appearance of an airplane instead of a bird. When you have completed and flown this second glider the modeler should have sufficient experience to draw his own simple plans of other ships, similar to the one shown.

VICTORY

Air Age Geography

(Continued from page 7)

hint that cylinder geography was out of date, and should have warned that the psychology based on an idea of the world as a cylinder was apt to create trouble. Therefore, scholars began to search for some kind of map to provide a basis on which we could better show these new streamlined trade routes. This search gave us equal area world maps, and one of the best of these is the ocean-basin homolographic map. It was made by stenciling the map on a big grapefruit, splitting the rind in the middle of each continent and then peeling. For each ocean, the pieces of rind are kept as nearly continuous as possible. Then the peeling is flattened and the outline traced on paper. This gives a new world map, map 3, and does not show the world as a cylinder at all; but rather as three great ocean basins: Atlantic, Pacific and Indian. The continents thereon do not fall into an Eastern and Western Hemisphere at all; they become mere rims of land around the ocean basins.

In the early nineteen thirties the airplane became a decided economic factor and gave us a three-dimensional world,

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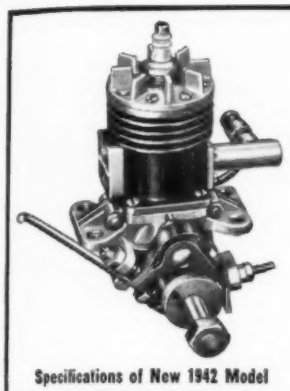

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and our ocean-basin map is not a three-dimensional—very much a two-dimensional picture. It is a broader and more meaningful picture of a two-dimensional world than the old cylinder world of Mercator was, but nevertheless still a two-dimensional world.

We now have an entirely new geography—an aviation created geography; ocean basin geography and the ocean basin psychology based upon it becoming out of date.

The new world geography must be represented on a map whose features are like those in Map 4. Instead of regarding the North Pole as the top of the map and the South Pole as the bottom, the airplane has caused us to place the North Pole at the center of the map, much in the way a hub is in the center of the wheel. Around that a small distance away is drawn a small circle which we call the Arctic Circle. Still farther away, a larger circle is the Tropic of Cancer, and out near the map's periphery is a third circle, the Equator. The Meridians radiate outward from the pole like spokes of a wheel. The North Pole is the center and continents radiate out from it like points of a star.

What ideas emerge when we examine such a map?

The nearest portion of our perennial enemy, Japan, territorially is an island of the Kurile group, just south of Petrapavlovsk on the Kamchatka Peninsula.

Minneapolis with its big inland milling centers is about the same distance from the nearest part of Japan as are the naval base and airplane factories of southern California on the West Coast.

We are talking much about hemispheric solidarity. We think that South, Central and North America constitute our special province of power; and yet on this map Brazil is closer to Spain than to New York.

Despite all these tough realities our children in school still study largely meaningless lessons based on cylinder geography. We, in the United States, therefore, face a dangerous situation; we are thinking on the basis of a cylinder world. We are trying to fight a war on the basis of an ocean-basin or orange-peeling type of geography. But we are fighting against an enemy which operates on a basis of pole-centered aeronautical geography. Needless to say, we are either going to learn or be submerged.

The first task therefore before us is to set our ideas in order and then we can determine whether we want this or want that in education. The first step in setting our ideas in order is to realize that geography, as Mikhailoff in Soviet Russia defines it, as Goebbels and Haushofer define it, is the ecology of human beings; it is the strategy of men, land and resources. We must seek, in further putting our ideas in order, to realize that the airplane has created a new ecology, a new strategy, and rendered imperative a new psychology—a social psychology in terms of a social geography, a new attitude of man toward his earth.

Then let us educate this and future generations of Americans to know these facts and to adjust themselves to them.

Smith Firecracker 2½ oz. ---------- $2.75
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When mobilized, the mammoth power of this great nation is supreme! Because the peaceful way has ever been The American Way all the resources of field and factory, all the productive energies of men and machines have been directed towards *"life, liberty and pursuit of happiness."* However, if *treacherous nations mistake* this peaceful intent for lethargy—the mighty wrath of an aroused giant will convince them otherwise—permanently! WE DID IT BEFORE—WE CAN DO IT AGAIN! —WE ARE DOING IT NOW!

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Prolong the life of your engine by careful treatment! If adjustment, repair or replacement is necessary—attend to it promptly!—or return to factory for vital servicing! NOTE: Some dealers may still have new "O.K." engines available.

KEEP 'EM FLYING!

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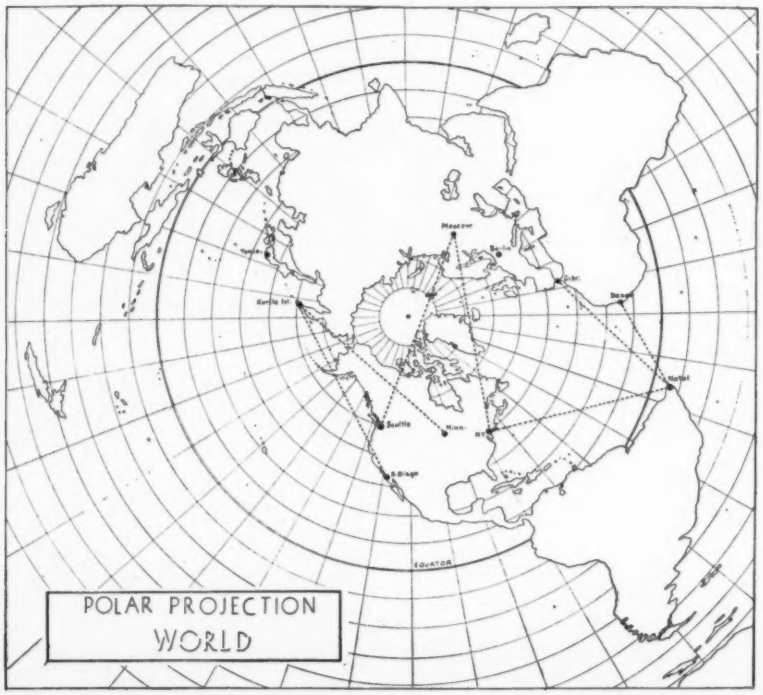
In doing so let us realize that geography is purely a social science, not a study of mountains or locations, and as such it lies at the very root of the other social sciences. Without it as a foundation, history, economics, sociology, government and even diplomacy and international relations become almost meaningless abstractions; become verbalizings.

We must realize too that geography is not an elementary subject. It should run all through the elementary years and on into adult education. Some phases of it are so advanced that Professor Haushofer had great difficulty in convincing the German General Staff and the German diplomats. We have not even known that it was something our leaders ought to learn. We have not even known that we ought to teach it or that it would be of any value to us as a people. It would not be, either, if it were merely a study of location and topography. Whatever we realize now, it is partially too late to use it as a preparation for this war. We cannot prepare or geographically condition the American people against a possible world war.

One thing we may be sure of is that the airplane has created a new geography. Airplane geography has replaced steamship, sailing vessel and rowboat geography. There is no better way to prepare people to live and succeed in such a world where airplanes rather than rowboats, sailing vessels or steamships, are the directing factors in human behavior, than to condition them for it through an education centered around a realistic air geography.

If we win this war, world leadership will be open to American people. Will they be too provincial, will they be too place-centered, will they be too meagerly informed, too lacking in knowledge of other peoples and adjustment of other peoples to problems of their environments, to grasp this post-war chance, a chance to be a great nation in a great world? That is a great task and it requires great and wide knowledge, operating under a world-wide vision.

VICTORY



Air Ways

(Continued from page 35)

wingspread of 13-1/2". The little "Rickenbacker" in the cockpit is carved from a piece of scrap balsa. Other details include twin Vickers machine guns, gun sights, radiators, oil pan, exhausts and other structural headaches.

Picture 28 shows a flying scale model

Build this fine Ship

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of a Curtiss SO3C1 built by Jack Hendrickson of Estacada, Oregon. Hendrickson says it is one of the best models he has ever built and it performs exceedingly well. Plans for this ship have appeared in MODEL AIRPLANE NEWS.

We hear from Al Davis of Chicago, who writes:

"With priorities limiting manufacture of many products for the model fan, Windy City enthusiasts add to their list of woes. The indoor flying site at the International Amphitheatre is now used by the Army. By the end of this summer the outdoor flying field will also be closed to all activity. This leaves the Lake Michigan boys, who once boasted of the first exclusive model flying field, municipally sponsored, without an official flying field.

"At the recent May 17th Chicago Park District Gas Model Marathon, Vernon Christensen of the Gas Lions topped a field of 200 entries by completing eleven of a possible eighteen official flights. Bucking a stiff wind and motor trouble, Ed C. Price of Aurora carried a first in the Junior Division. In the six hours of flying, at the rate of three official flights of one minute or better, Seniors Richard Jordon of Waukegan completed ten; W. C. Johnson, seven; Milton Burley and Charles Eves, five flights, for second to fifth places. The eighteen and under class tallied with: Jerry Jacquert, Kankakee, seven. Merwin Bristol, Oak Park, six; Bob Hamilton, six; and Gene Hughes, five.

"As is the custom with the Chicago Aeronuts, trying to set national records is their favorite pastime; especially Joe "Pappy" Matulis who set a new high in the outdoor helicopter of 48.8 sec., under the 1942 rules. John Bock, an autogiro enthusiast, qualified for honors in the Outdoor Autogiro class with 38.8 seconds to make his claim to fame.

"To bolster the Windy City's model airplane building population, hundreds of sailors training for aircraft service are devoting their spare time to model construction and flying. Former 1940 National Contest Director Frank Nekimken, now a civilian fabrication instructor at the Naval Training Center, has organized a model club for the sailors with the Navy's full cooperation. Club members include Fireman Bob Boland, East St. Louis, Illinois; App. Seaman Jack Lundgren, Portland, Oregon; Fireman James Brady, Olympia, Washington; Fireman Irving Lowe, Brooklyn, New York; and Schyler Borum, Delta, Colorado.

"Here is a real story of glider flying. Gordon Lambrecht, dissatisfied with results from gliders up to the seven foot mark, decided to go to the larger class. He built a 14 foot sailplane with a 42" stabilizer and a 17" rudder, equipped himself with a 100 foot fishing line and a five foot gas job. Gordon tow-launched his masterpiece and at a few hundred feet it cut loose, caught an updraft and was away. In the ensuing twenty mile chase he managed to keep it in sight, but finally it was lost in the sun. Three weeks later, Gordon had his model returned by a farmer some 55 miles from the takeoff point, somewhat rainsoaked, but still in good shape.

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EXTRA-POWER FUEL

Here is a fuel scientifically blended to bring out the *maximum* performance of your model plane motor . . . a fuel that means quicker starts, greater power, *longer flights!*

Phillips Model Motor Blend is a combination of high-quality gasoline and fine lubricating oil, blended to give your motor new zip and power. Actual laboratory tests prove this new fuel delivers quicker starts at high or low temperatures . . . greater climbing ability . . . higher R.P.M. And it's especially suited for breaking-in . . . will help keep your motor *new!*

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If there is no Phillips Station in your locality, send 60¢ (money order or stamps, NOT coins). We will send you a *full quart* promptly, express collect.

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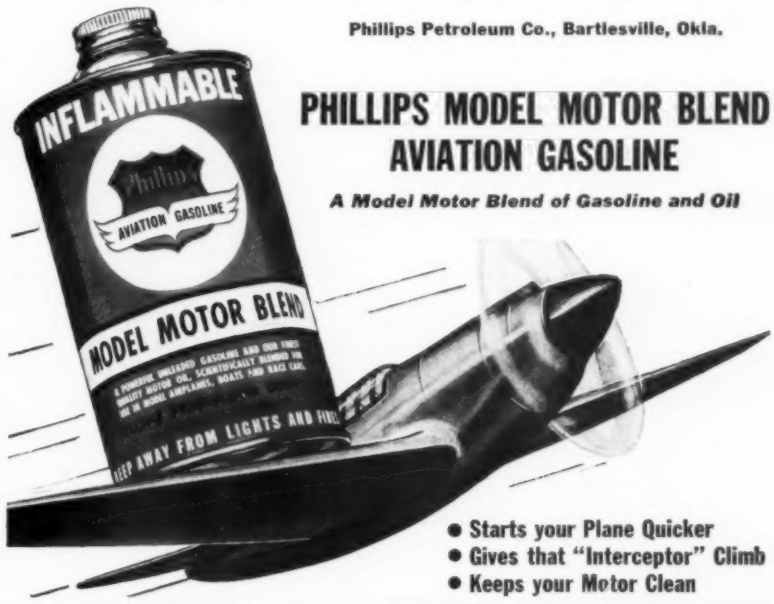

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A Model Motor Blend of Gasoline and Oil

- **Starts your Plane Quicker**
- **Gives that "Interceptor" Climb**
- **Keeps your Motor Clean**

"A keen interest in model aeronautics for several years rewarded Joseph Baron with a No. 1 spot over 150 of his classmates at Loyola University, when he qualified as a Flying Cadet in the Army Air Corps."

(All Midwest and other model clubs throughout the country should not fail to send in notices of contest dates to: "Air Ways," MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City. They will be published monthly and this will help to enlarge your entry list. However, these notices should be in our office at least two months ahead of the date of the contest.)

Mr. Davis also sends us some pictures. Picture 25 shows Chicago Model Aeronut John Bock with his autogiro which set a new record for outdoor autogiros with a flight of 38.8 sec.

The Chicago Flying 8 Balls Club is shown in picture 27 at one of its recent contests. They are, left to right: Richard Des Jardins, George Tzantzos, Art Christensen, Bill Steinberg, Bruce Blegen, Dave Steinberg (Pres.), Fred Fleg, Don Walco, Don Llanciza and Gus Hoffman.

Picture 26 shows Walt P. Adams, a Gas Model Aeronaut member; an ardent model flier and Chief Pilot for United Air Lines.

St. Paul Modelers Meet

Mr. Lytton Calrow of St. Paul, Minn., senior advisor of the St. Paul Modeleers, sends us some interesting news from his community:

"The Modeleers Club met recently and awarded $70 in prizes for Navy solid scale model airplanes, judged at the Annual Air Meet by the following: F. L. Greene,

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Keep your old engine and ship in tip-top condition. Use genuine replacement parts and accessories. If you want a new model or motor, try selling your old job. It helps to keep more builders flying.

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Sanded Poplar wood, 8" to 14"..... 15c

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All prices include coil and condenser.

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Smith Competitor Coil 1.95
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NEW AD-A-CELL BATTERY BOX
Cut Battery Costs 60%. Use two to six Cells. All plastic Construction. Perfect for weight rule contests and balancing model..... $1.25 P.P.

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2" Sponge Rubber Wheel ..... pr. 40c
2½" Sponge Rubber Wheel ..... pr. 45c
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GENUINE "T-56" BROWN RUBBER
Limited supply available. Not more than one skein to a customer.
1/16"—225 ft. skein ..... $ .65
1/8" wide—225 ft. skein 1.25
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Put your old motor in tip-top condition yourself. We have the replacement parts in stock for the following motors:
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Berkeley "Gondolier" Floats hold more records than all others combined. Now is the time to build your floats for the summer.
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THE MODEL AIRCRAFT HANDBOOK, by William Winter. More than 100 drawings and three-view plans. This new book gives you a complete course in model aeronautics without formula, graphs or mathematics..... $2.00 P.P.

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Mack Truck; Ensign C. B. Wright, Jr. U.S.N.R. Naval Aviation Cadet Selection Board, Wold-Chamberlain Airport; H. W. Scovel, N.Y.A., Miss Janet Wakefield and Miss Rose Dale, Minnesota Women Flyers.

"Solid contest winners are as follows: For most Navy planes built: David Wightman, Hastings, Minn., built 45; Donald Weiland, Hastings, Minn., built 30 (this boy has been on crutches for the last four months); Al Brandt, St. Paul, built 26.

"Winners in workmanship: Al Brandt, 718 Oakdale, St. Paul, $29.00; Bud Butcher, Minneapolis, $12.50; Les Clements, St. Paul, $8.50; Chester Lundgren, St. Paul, $5.00; John Rybak, St. Paul, $2.50; Bob Trussell, St. Paul, $2.50; John Read, St. Paul, $1.00; Albert Dorer, Minneapolis, $1.00.

"Prizes for the Navy Contest were arranged for by the Minnesota Women Flyers; Lt. Ross Dale, Chairman, and Leonard C. Olson, State Vocational Director. Over 200 planes were judged. These will be turned over to the Navy for training cadets in identification of aircraft and a study of range and cone of fire.

"The Modeleers Fourth Annual Meet was a decided success. Over 150 entries arrived early in the day.

"Doug Lagerstedt, St. Paul, offered a rubber model airplane for action in the 'Anti-Aircraft' demonstration held by the Midway Chapter, Izaak Walton League. Lagerstedt launched his plane while Warren Hinz, of Minneapolis, brought his 20 gauge to his hips and cracked the nose of the plane on the first shot—a perfect bull's-eye. The plane collapsed completely in mid-air and fell to the ground, a splendid demonstration of what is in store for Hirohita-Hitler.

"Peculiar air currents were noted Sunday and an exceptionally large number of planes collapsed over the takeoff. A small twister came through and removed several wings—good training for India's monsoons. Many planes flew away. Bill Bennett, Bob Samsel, Wallie Ericson, and Tom Roberts of Minneapolis, and Stan Cowing of St. Paul reported lost planes.

"Wallie Ericson followed his red Playboy powered by an Ohlsson 60 from the Model Airport on Highway 36 and Snelling to considerably past White Bear, a distance of 19 miles, before it went out of sight in the clouds. No doubt the plane landed well into Wisconsin.

"The St. Paul Modeleers Club dedicated their new 1/24 mile concrete race track before a crowd of several thousand. Carl Larson of Minneapolis established a track before a crowd of several thousand powered Richter miniature race car. Racing, flying, trap shooting, horseshoes, and archery will be featured every Sunday through the summer at the St. Paul Model Airport."

Hurray for Mr. Calrow and his work in helping to establish the St. Paul Model Airport! Let us have more model airports—one in every city and town. That will do more to popularize models and sell the idea to parents than any other thing; there are still some parents who do not realize that the Air Age is upon us—that either we fly or take orders from somebody who can. Mr. Calrow makes some interesting comments in one of his letters:

"The U. S. Navy is begging for the balance of the 500,000 solid identification models now under construction. Production is lagging on account of difficulty in convincing parents and children of the importance of this work.

"The St. Paul Modeleers Navy Project at 99 E. 6th agreed to furnish 1,000 models by June 30th, only two weeks from the day the Project started. On Friday, the 19th, just a few days after this announcement, over 500 models were displayed before they were shipped to the Navy. One boy, David Wightman, built 45 of them!" The display of 500 models is shown in picture 23.

Massachusetts

The Jordan Marsh Co. of Boston recently tied up shoppers along the street (picture 29) with its attractive window featuring models of the world's fighting planes, but to the scale of regular identification ships. When the person in front of the window pushed a button with the name of a plane on it—for instance, a Martin B-25 bomber, etc.—immediately a red light flared up below the correct model in the window. In this way anyone could determine the name of any plane in the window—just a guessing game. All this goes to prove that grown-ups are interested, and the Jordan Marsh Co. merely made use of this increasing interest.

Fresno Championship Meet

Mr. Bill Council of Fresno, Cal., sends us the following report of a recent contest on the West Coast:

"Sunday, May 31st, marked the third annual Fresno West Coast championship meet of gas model airplanes. This contest was sponsored by the Fresno Exchange Club and the Fresno Gas Model Association. Prizes for first three places in each of three classes, A, B and C, totalled $250. Prizes were identical in each class: first place, $50 war bond; second, $25 war bond; and third, $10; with trophies in each place. There were also many merchandise prizes, and ribbons were given down to twenty-fifth place in each class.

"About 3,000 people watched the flights

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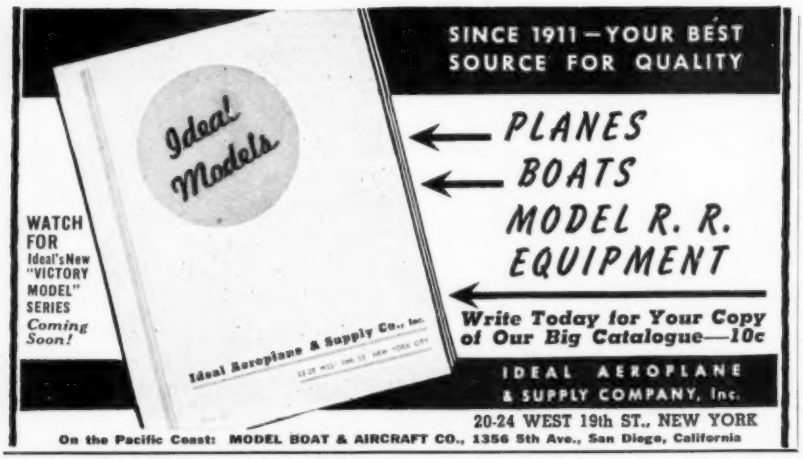
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from 8 a.m. until 5 p.m. Ideal weather conditions prevailed but the field was rough and crackups were many; nearly 30 ships crashed in takeoff or landing. One little ship, that of Grace Robison of the East Bay Aeroneers, buried its motor eight inches into the ground in a dive-bomber type of crash.

"In class A, first place went to Ted Gillette of Los Angeles, 1060 seconds; second place to Harold Austin of Oakland, 920 seconds; third place to Joe Menezes of Hanford, 907 seconds; fourth place to Frank Gillistl of Fresno, 756 seconds.

"Ted Gillette also took first place in Class B with a time of 986 seconds; Dick Pittenger of San Francisco, second with 912 seconds; R. J. La Miller of Tracy, third with 731 seconds, and Glen Brown, fourth with 730 seconds.

"Dick Diel of Oakland topped class C with 2,433 seconds. Dick also took the Don Foote trophy for winning this class with a Westener. Second place went to Haig Maraslikian of Dinuba, 1,762 seconds; third to Fred Bonar of Bakersfield, 1,591 seconds; fourth to Wallace Barrett, 1,395 seconds.

"Gillette and Diel became Pacific Coast champions by winning the three events. James Monroe, the defending coast champion, met hard luck before the contest got under way; his ship crashed in a trial flight.

"Edward 'Tex' Marbut, 16, of Fresno, won the Eastman trophy as the highest point winner in Fresno County. Tex also won the Frye Aircraft Corporation trophy for the longest single flight, 1,580 seconds.

"Arle Armstrong was manager of the meet; Dr. Earl Coleman of Fresno State College, served as head timer; and R. A. "Dick" Wood of Bakersfield, contest director. There was much comment about the friendliness of the Bakersfield and Fresno clubs, as indicated by the asking of a member of another club to serve in official capacity in this meet. Gene Myers of Bakersfield also furthered this kindly spirit by assisting President Ocie Randall on the public address system.

"Major J. C. Doherty of Hammer Field headed a staff of technical sergeants who served as timers. To these men from the Army goes much of the credit for one of the most smoothly conducted meets ever held here.

"As further evidence of cooperation from the Army, Lt. Dorcy Pohlenz and Sgt. B. H. Evans served as judges in the Beauty Contest. This was not to choose Miss America, but to select the best appearing plane after the first flight. Arle Armstrong of Fresno won this trophy given by the Bakersfield Gas Model club. He did have a beautiful ship—a high wing Sailplane with an 8 ft. wingspread.

"No new records were established, though many were threatened. Seven planes were carried away by the wind and reported lost; however, many of these have since been recovered.

"Attendance at this meet was from state-wide points. Vernon Oldershaw of the Bakersfield club stated that the boys there pooled their cars for the trip. A great many of the other clubs did this also.

"It seems likely that the best attendance was from the East Bay Aeroneers of Oakland; as nearly as could be ascertained, they were there 100%. It was also noticeable that practically all of them were flying Westerners, which fact should give Don Foote a comfortable sort of a glow. The Aeroneers have also developed a dethermalizer that seems to work very nicely. This invention is operated by a small timer; at the end of a set period a tiny parachute is released from about the middle of the ship; the cord of this parachute is fastened to the tail of the ship and lifts it to about an eight degree angle to pull it out of a thermal.

"The fellows around the bay all seem to be doing things. Anthony Chausse, as spokesman for the Marin Model Airplane club, said they were pioneering a ten minute flight regulation.

"Bob Hanford said the Pasadena Barnstormers were well represented. Bob and the rest of the Pasadena fellows are top-notch fliers, even if their luck wasn't so good this time. The Los Angeles club was on the job, too. In this group was Ray Acord, who won the trophy for the longest single flight at the 1941 Nationals in Chicago.

"No account of this meet would be complete without a hats-off to the ladies who worked so cheerfully in the blazing sun to help make the affair a success. Frances Gruenwald, Hazel Randall, Ruth Armstrong, Mrs. Red James, Patricia Gruenwald, Miriam Winter and Gwen Randall were all perspiring and sunburned. But when the time comes for another meet, they'll be there!"

Picture 30 shows the lineup of planes and contestants for the Beauty Contest.

New Jersey

Roland T. Mayer of Hoboken writes: "Recently, while trying out a new idea concerning use of a biplane stabilizer, I was amazed to find that it improved the glide and gave the glider a terrific climb. Another good feature about this glider is that it will not loop.

"Immediately I designed and built a glider around this idea. After a few adjustment glides, I launched it in a slight bank to the right. Instead of spiralling up like most, it climbed practically straight up, still retaining the banked position. It showed no tendency to loop, but as its speed died away the bank took effect and it rolled out into a beautiful soaring glide. The next flight showed the same good tendencies.

"Unfortunately, on the seventh flight the ship hooked a thermal and was lost, after remaining in sight for 2:14. Luckily I had drawn the plans before I flew the glider and soon had another one built. Although it was quite windy when first flown, this glider showed the same flight tendencies as the first and was very stable in the wind. After about twenty flights it was also lost out of sight in 1:42.

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"Both gliders averaged from 40 to 50 seconds and had very stable flight tendencies."

Andrew Canino of Vineland tells us: "The Vineland Aeronauts held their June gas meet on the 7th before close to 1,000 spectators, who came from New York City; Springfield, Frankford and Philadelphia, Pa.; and Linden, N. J. Awards valued at $100 were distributed.

"Lew Rose of Springfield, the contest director, had high time with 404 sec. He flew his model on a 10-sec. motor run and lost it on its first flight. Luckily it was returned after a few hours. Having no dethermalizer, Lew cut his motor down to 6 sec. but again it 'went places', but this time did not return.

"John Buri of Springfield won 1st place in class B with total time of 183 sec.; while one of South Jersey Gas Model Airplane Association's leading fliers, Ken McElvee, took first in the large class C Beauty event. Winners all hailed from the Camden Club with father and son taking two first places. Dwight Shuster, Jr., received 1st prize; Dwight Shuster, Sr., 2nd; and Herb Saunders, 3rd.

"In the Stunt event Dick Apperman of Frankford won; R. Shippard of the P. G. M. A. A. was second; and John Buri, 3rd."

California

Apparently we have a revolution on the West Coast, for Anthony Chausse of San Anselmo writes:

"Fliers on the Pacific area refuse to fly under the new 1942 AMA rules. This has resulted in a total lack of any organization for fliers on the Coast."

Something must be wrong. If the West Coast fliers object to the AMA rules why don't they write to MODEL AIRPLANE NEWS and state their grievances so that their magazine can take up the fight to improve the rules, or at least to present their case in the matter?

Mr. Chausse continues:

"Of late the meets have not been well attended and an air of indifference has prevailed amongst the fliers. In order to bring about some kind of order, the West Coast Model Aircraft Regulations have been adopted, which are as follows:

"1941 A. M. A. rules with these additions:

1—All ships must be equipped with a dethermalizer.

2—Longest flight to be 10 minutes, or less if the contest director so rules. A 10 minute flight or any longer flight is to be recorded as a 10 minute flight.

3—Contestant allowed to guide or push his ship on take-offs provided he does not take a step forward. No hand launching.

"One of the first contests to be run off under these rules was held June 21st at San Rafael, California, under the sponsorship of the San Rafael Exchange Club and the Marin Model Airplane Club. Anthony Chausse was Contest Director, and the meet was a howling success with remarks of satisfaction with the new rules being heard all over the field.

"The weather was perfect—hot and no wind until late in the afternoon when the contest was almost over. It is interesting to note that of 31 planes entered in the contest only 3 were lost, and this was due to two of the contestants forgetting to release their dethermalizers and having overtime motor runs of 45 seconds and 3 min. 23 sec. The other plane was lost by Russell Watkins of Oakland when his dethermalizer failed to release in the only official flight of ten minutes or over.

"High man in class C was Russell Watkins of Oakland. With his Ohlsson 60 powered Westerner, he piled up a total time of 20 min. 18 sec. In second place came Bernard Tesch of San Francisco with his Ohlsson 60 powered Westerner with 13 min. 18 sec. Earle Romak of Oakland, one of the 'Flying Romak Clan', took third with another Ohlsson 60 powered Westerner; time, 9 min. 2 sec.

"In class B Dick Pittenger of San Francisco took top honors with his Phantom powered Zipper; time, 11 min. 21 sec. Second place was won by Kurt Holzhaus-

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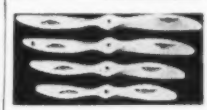

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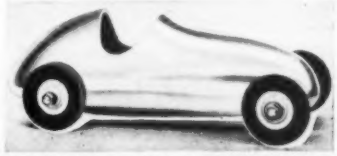

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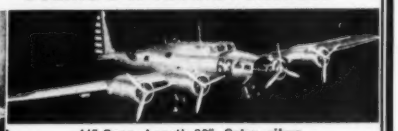

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er of Vallejo with his Ohlsson 23 powered Playboy Junior. Jack Woodard of Oakland wound up third with his Ohlsson 23 powered Interceptor.

"In class A Jack Dyer of Brisbane stole the show by taking 1st and 2nd places; 1st with an Ohlsson powered (19) Interceptor, and 2nd with an Atom powered home design. Milton Taylor of Oakland took third place with his Dreadnaught powered Interceptor."

VICTORY

Flash News

(Continued from page 2)

cost for private operators such as Pan-American Airways, British Imperial Airways, Deutsch Luft-Hansa, etc.

The greatest balloon barrage ever attempted has been successfully established on the West Coast from Mexico to Canada to provide protection for the vital Southern California aircraft industry, the San Pedro and San Francisco shipbuilding firms and the giant Boeing enterprise at Seattle. How many balloons there are or where they are located is a military secret, but residents of this area can attest to the huge number by the horizon dotted with the lazily floating silver-coated sausages. The Army has announced, after repeated questioning as to why the blimps were not camouflaged, and why they were placed silver in the sun —a beacon light to enemy raiders—that the object of the barrage balloon program is to make them perfectly obvious to possible enemy raiders, forcing them to fly high to avoid them. Camouflaged, the enemy would not see them and could conduct their raids from low altitudes which, even though many bombers might crash into the heavy steel cables, would be vastly more costly and damaging due to the bombers which *did* get through.

The first air-naval action by the United States Air Forces in the Mediterranean resulted in extensive damage to the Italian Fleet. A number of Consolidated B-24 Liberator four-motored bombers, part of a squadron which flew across Roumanian oil fields to land in Egypt, attacked a scouting force of the Italian Navy and, after throwing the entire force in "wild confusion," succeeded in sinking a 10,000 ton cruiser of the Trento class and scoring a torpedo hit on one of the fleet's two battleships.

The commander of a British submarine in the vicinity revealed: "The Italian fleet was thrown into such wild confusion it was impossible for us to aim our torpedoes and we stared through our periscopes in amazement at the Italian fleet's panic!"

The United States Army Air Forces are now in actual engagement with enemy troops in Europe on two fronts: with the British in Egypt and with the Royal Air Force against Nazi-controlled territory on the coast, it has been announced. Consolidated Liberator and Douglas Havoc planes, owned by the U.S. and flown by Army Air Forces crews, are now smashing at the Luftwaffe in the desert and in the Lowlands, presaging the opening of the final all-out aerial battle over the Second Front.

Consolidated Steel Corporation in Southern California has been awarded the Navy "E" for Excellence in its vast program of

manufacturing "Ack-Ack" guns for the Navy. These powerful five-inch weapons are used aboard all Navy vessels as anti-aircraft guns and thousands are rolling off the production line. Consolidated thus joins Pratt & Whitney and Bell Aircraft on the Navy's roll of honor.

Maj. Gen. Dwight D. Eisenhower has been placed in command of all U.S. Army forces in Europe. He is now in London mapping plans for the long-awaited Second Front offensive, which will comprise an all-out aerial offensive against the Reich, now well under way with the R.A.F.'s "thousand-a-night" program against German industrial and military targets.

Lieut. Gen. George H. Brett, formerly Assistant Chief of the Army Air Forces and Commander of the Air Service command, now in command of all Allied Air Forces in the Southwest Pacific, has been awarded the Distinguished Service Medal for his outstanding services in Britain, Egypt, Burma, Java, China and Australia. Working under the renowned General Douglas MacArthur, Brett is believed to have organized a huge air force assault against Japanese-held territory in this great sphere of the war, and on the success of this attack may hinge the verdict of the vital Southwestern Pacific Area.

New Zealand, most remote of Southwest Pacific Allied strongholds, has expanded its air arm sevenfold, it was recently announced by Air Commodore H. V. Goddard, chief of the New Zealand Air Staff. "We are now prepared to meet a Japanese threat with ten times the weight of bombs we could have mustered after Pearl Harbor on December 7th of last year," he states. "The quality and quantity of our aerial defenses has been expanded sevenfold and New Zealand stands ready to protect itself against any eventuality from the air."

Frank Fuller, Jr., famous racing pilot and winner of the coveted Bendix Trophy for cross-country speed flying, has joined U.S. Naval Aviation forces to do his part in flying against the enemy. Fuller has flown racing ships for many years and there are few airplanes "too hot" for this veteran airman to handle. He is a scion of the famous Fuller Paint fortune but has sacrificed this for his country's aerial assault.

The rubber life raft on which Gene Aldrich, Harold Dixon and Anthony J. Pastula floated for 34 days in mid-Pacific after their Douglas Devastator torpedo plane made a crash landing in the sea, has been placed in Annapolis Naval Academy's permanent historical exhibit. The three intrepid airmen are now making a nation-wide tour in the interest of Naval Aviation enlistments, after which they will return to their duties as Uncle Sam's fliers.

Douglas Aircraft is now planning a fleet of huge "Flying Boxcars," nearly double the size of giant C-54 transport planes which are revised versions of the huge Douglas DC-4 four-motored transport. "One hundred of these giants will be able to do the work of 206 C-54's" Donald Douglas, head of the firm, states.

Twenty officers and three enlisted men have been awarded the Distinguished Flying Cross by Lt. Gen. Arnold for their Tokio exploit, under command of Brig. Gen. James H. Doolittle. More details have been announced by the War Department:

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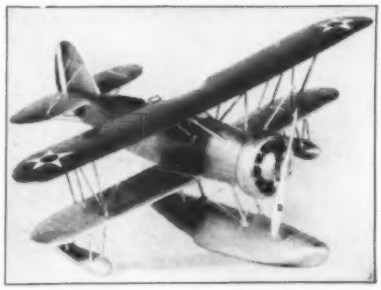
Since there was an obvious possibility that one or more of the North American B-25 bombers might be shot down into Japanese hands, the famous and secret Norden bombsight was removed and a small, handmade sight costing only *twenty cents* was installed.

The gigantic Glenn L. Martin Company has set up a huge "College of Airplane Knowledge" at its plant to instruct Air Forces Technical School mechanics in the fundamentals of service and repair to B-26 bombers. The college of 2 classroom buildings, laboratory, 5 dormitories, 7 barracks and a mess hall is designed to accommodate 500 men at a time. The course, given by 75 experienced Martin engineers, intends to graduate 200 cadets every 12 days and is a model for other manufacturers. Lockheed Aircraft now has 750 instructors being readied for a course planned to turn out 1,000 Air Force crewmen a month; Consolidated Aircraft is organizing a similar program.

European aviation authorities are beginning to believe that Germany has stolen a march on the United Nations when she produced the new BMW-801 double-row air-cooled engine, now being used in the Dornier 217-E and Folke Wulf 190. The efficiency of this engine has been greatly increased by a special type of cowling of new design. The improvement lies in two factors: 1. The gills at the back of the cowling are done away with and a special ring is used which slides forward and back to reduce or increase the exit opening or the cooling air, passing out from the cowl-

Modern Warbirds



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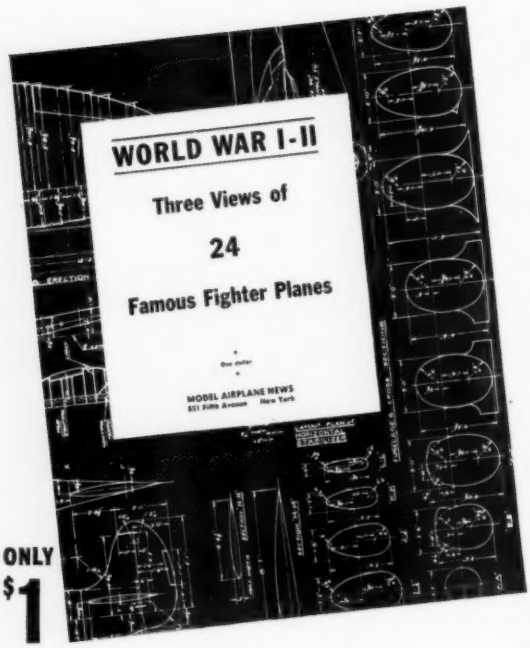

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ing. 2. A fan running 3.16 times as fast as the airstream is located just back of the air intake opening in the front of the cowling. This insures perfect circulation when on the ground as well as in flight and eliminates the necessity of producing suction at the rear of the cowling by opening gills, which in turn increase drag considerably. In this way efficient cooling at all times has been obtained with considerable reduction in drag, resulting in higher flight speed. The hp. ranges from 1380 at takeoffs to 1460 at 16,300 ft.

Considerable research has been done with this type of cooling in United Nations laboratories, however we know of no other planes using this system appearing in the Allied ranks. VICTORY

Designing for Snap

(Continued from page 31)

landing gear in each of the above sketches is identical in order to show results obtainable by varying upper and lower longerons profiles alone. Another aid in achieving a scrappy appearance is to increase the fuselage depth in front, thereby making the body seem shorter. Such depth may be obtained by adding a tunnel radiator, or in the case of radial motor, an oil cooler will be found an aid toward this end.

Third and fourth lines of drawings suggest types and shapes of nose blocks to improve the appearance of your model. Type A would suggest the housing of an inline motor and provide for a low line of thrust. B is an inversion of A. A centerline of thrust may be obtained by use of block shapes similar to C. Type D is a refinement of A to which is carved a base for a spinner.

An interesting effect can be obtained by the use of nose block E which indicates a Vee-type motor through its rounded upper section. This type saw actual use on the early model 40 Boeing mail plane of about fifteen years ago.

At F we approach the more modern method of motor cowling for those who wish to take the additional time required to build it. This outline indicates a well rounded front end tapering to a spinner with cylinder bank streamlines projecting outward. G provides for a center thrust line with a radiator carved into the lower front face and is similar to the type used on the author's TP-6 model (MODEL AIRPLANE NEWS, March 1938).

At H, line 4, we have a setup which might indicate, for example, a Fairchild Ranger engine. Now coming into prominence in the U.S.A., largely through increased use of the Allison engine, is the comparatively difficult to construct, but highly streamlined nose type shown at I.

Air cooled models may be improved in looks by addition of a suitable cowling; thought must be given so that the correct cowling type is chosen to bring out the best final attitude. Cowling shown at J is the familiar speed ring type and we found its use in large aircraft more as an accessory toward a speed increase than a design element engineered as a definite plane component. To house the twin row type of motor, cowling K has found favor. The "grand-daddy" of all speed cowlings, developed by N.A.C.A., is shown at L. The last two types should only be used on fuselages specifically designed for each cowl and not promiscuously applied or the fine effect they give will be lost.

Rudders play a highly important part in any design's final appearance; their outline will often spoil an otherwise good-looking arrangement. Several shapes are shown on the fifth line of drawings. You will notice definite characteristics in each case: (1) a wide base chord, narrow at the tip, (2) an almost vertical leading edge, (3) a heavily tapered trailing edge. Figure A illustrates these properties with straight leading and trailing edges. An almost identical form is shown at B except here we have leading and trailing edges slightly rounded. Notice, too, the marked increase in the area of B over that of A, afforded by this rounding dodge. A third form, shown at C, combines general characteristics of the previous two rudder types but gives an altogether new outline.

Although monocoque rudders will vary considerably according to the model builder's own ideas the form shown at D may be considered as standard for this type. Twin rudders follow closely the rules set forth above in their upper halves, but the opposite of the rule (almost vertical trailing edge) should be applied to their lower halves.

Much of your design's success depends upon the landing gear not only as a necessary plane part, but as a means by which the intent of your design may be made convincing to others. Most simple addition to

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the common two strut type gear is the sheet balsa fill-in shown at A. A modification, E, calls for fairing on either side of the struts projected and streamlined against the wheels as applied in certain North American training planes. In B and C the landing gear struts, when viewed from the front, are bent at a point far enough above the axle to enable an integral fairing and wheel pant to be used. Remember, however, in such landing gear designs care must be taken not only to align these fairings to minimize any possible rudder action so far forward of the center of gravity, but take into consideration, as well, the side area effect they will have on the rudder, for which you have provided.

A simple cantilever gear shown at D is similar to that used on the Douglas O-46 line while F and G are types particularly suitable for low-wing models. If you choose the exposed wheel type of landing gear, it sized wheels will add considerably to the is interesting to note that slightly oversnappy appearance of your model. Similarly oversized pants will have the same effect.

Having covered the essential features of "designing for snap" considerable improvement in appearance can be had by thoughtful addition of various accessories. A most helpful accessory and one that provides a great deal of realism, is a windshield and head rest combination, shape of which will greatly improve any design with little or no extra work at all. The windshield shape for an open cockpit will usually remain the same in every case but head rest outlines can be widely varied according to the designer's likes. More complicated are the enclosed hatch type covers which usually entail a great amount of work.

Tunnel type radiators are a useful means of adding snap and may be made of various proportions and outlines; imitation oil radiators are an aid as well. Ventilators, airscoops, and louvres may be added to improve design details.

When designing a liquid cooled type the problem of disposing of the "exhaust" will provide the model designer with a chance to display his ingenuity. Several eliminators are standard. A series of short stacks, one for each cylinder will make an impressive accessory. These same stacks may be accentuated by setting them in a silver background. A series of four oval stacks, or even one complete outlet the correct length and projecting slightly from the body, might be more modernistic. Another type could be made to project outward, and down flat to the cowling side.

Drawings found on line 7 will show the result of applying the above principles. Side view at A shows a drawing of the author's P-6 model in its original form. Notice that a nose block similar to G (line 4) and fuselage form B were used as a basis for this design. This machine has all the requirements of a good looking model but notice the vast improvement as shown in sketch B identified as P-6A.

Fuselage and nose block for the P-6A have remained unchanged from those of its predecessor. Steps taken to obviously improve appearance, and add desired snap, include a major alteration in the wing attachment, which in this case was placed flush with the fuselage top instead of mounted parasol style. A tunnel radiator, front surface of which was made a continuation of the radiator already carved into the nose block, was added thereby deepening the front of the body. Fairing was added to the already existing landing gear. A differently shaped head rest accentuated the downward cast of the upper longerons at the rear and a new rudder shape added a desired "forging ahead" aspect.

While these suggestions have come about through more than ten years' experience in analyzing and designing snappy models, they represent only one builder's findings on the subject. Any model builder may discover, however, that his individual style of design combined with suggestions contained herein, will open a new vista on which his imagination can work.

Do not feel that "designing for snap" must necessarily be limited to the field of military type models or models built outside of contest requirements. The whole process resolves itself down to the fact that snappy appearance is brought about by illusion alone and may be applied to the most sincere attempt at a record breaking design with satisfactory results.

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Flying Scale for Beginners

(Continued from page 11)

smoothly. A slot is removed on the rear side of the prop to enable free motion. If you are a beginner you should obtain a machine-carved propeller at any model shop or supply store.

Power consists of two strands of 1/8" flat brown rubber. If your model is too heavy for two strands, try three; this should be sufficient power to make your ship perform. As you know, this model is lightly constructed, which enables it to fly efficiently on very little power.

ASSEMBLY: The assembly starts only after all sections have been sanded down to required sizes, so take your time and better results will follow. First add the cabin structure and celluloid. Next add tail surfaces, which are in two pieces. The rudder is simply placed on top of the fuselage. The stabilizer is slipped in position and glued, having —1° angle of attack. These should be put in perfect alignment and allowed to dry.

The rear hook may be added next by merely cutting out a notch and inlaying the hook, using plenty of glue. Before starting on the next assembly it's best to add the two strengthening clips one on each side of the fuselage as shown on plate 1.

From there we go to the wing, which is in two pieces, both glued in position at the same time. Be sure the wing bed has the correct amount of incidence. Notice the wing contour; this curved shape takes place when the wings are set in position. The wing can be held in position by the use of pins. The correct amount of dihedral is shown on plate 2; add this, then set aside to dry.

The landing gear comes next; take one leg at a time and glue firmly under each wing panel. You can hold the legs with the fingers until the glue has set. Later the 3/4" hardwood wheels are added, which completes it. The propeller and nose plug can be added last—and this completes the picture.

Painting the model should be discouraged because of excess weight and warping. A few small parts may be painted; such as nose, wheels, aileron and tail surfaces outlined on the drawing. The tail surfaces, parts and ailerons are painted with India ink; this will not warp the surfaces.

FLYING: Select a calm day, when it is best to study the flying characteristics of your model. Test glide your plane and readjust if necessary until you obtain a nice smooth glide. To obtain correct balance add weight to the nose or tail; or adjust the tail surfaces.

Once the glide is satisfactory, try short power flights. If the model does not perform well change the thrust line by adding a piece of wood at the top of the nose plug tilting the thrust line down; this method may also iron out any other fault it may have. The model should have a steady climb, circling to the left and gliding in the opposite direction.

One good method of storing energy is to use a winder. Use an S hook at the rear, also winding it from the rear. Since the model is very light and has little head resistance very good flights can be obtained by using this method.

A little patience and care will greatly reward you with a realistic and fine flying plane.

BILL OF MATERIALS: (All Balsa medium hard except where otherwise specified).

One piece of 1/16" x 3" x 18" for fuselage.
One piece of 1/32" x 3" x 18" for wings and tail.
Small piece of 1/4" sheet for nose.
Two feet of No. 14 size piano wire for hooks, landing gear and cabin.
One prop block 1/2" x 1" x 6" or machine carved.
One pair of 3/4" hard wood wheels.
Four feet of 1/8" flat brown rubber.
Washers, celluloid, sandpaper, pins and glue.

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2 *Use rubber lubricant to prevent "cutting" of rubber.*

3 *Use gas and oil mixtures recommended by the manufacturers of your motor.*

4 *Don't fly your model recklessly. Make many careful test flights before flying under full power.*

5 *Use materials carefully. Save small pieces that can be used in other models.*

6 *Use dethermalizers to prevent loss of your model.*

7 *Keep cement and dope containers tightly closed to prevent evaporation.*

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In the adjoining column, Comet engineers have listed a few general rules by which you can help to conserve vital materials. Follow them faithfully—and let's prove to the world that model building not only has a definite place in the war effort, but that model builders know how to save war materials!

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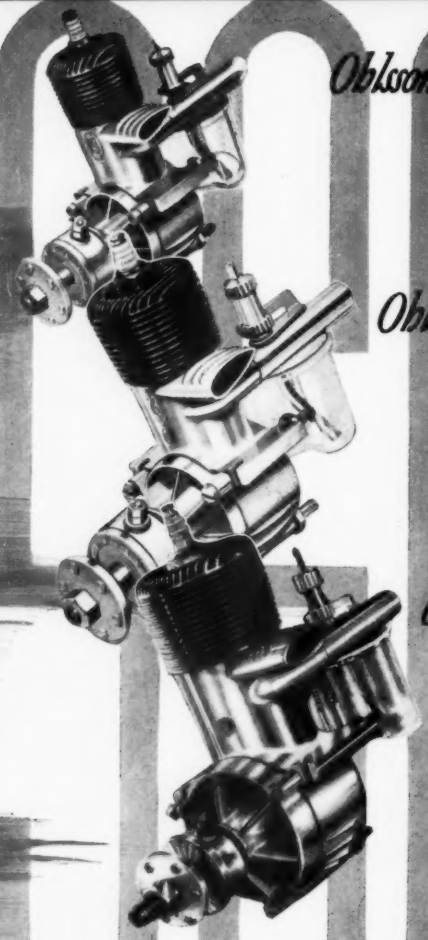
The A B C



Ohlsson 19 CLASS A.... $14.50

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Coil and condens
above motors op
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of training for a career in Aviat

—of flying winning models!

THE MOST important moment in a modeler's life is not when he complet
gas model, or even when he wins his first contest, although both of tha
are milestones in his progress.

The most important moment for any modeler is when he *makes up his*
be a winner, no matter how tough the competition may be or how many bu
to get out of his own shop.

This is the A-B-C in model flying, or of success in any of the branches o
nautics which the modeler may follow later.

Dependable motor performance plays a vital part in successful model flig
Ohlsson Motors in all three classes have *proved themselves* dependable, po
and durable. They are built by the most highly skilled and thoroughly expe
craftsmen in the industry to give modelers (A) power, (B) smoothness,
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